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ABSTRACT

One of 15 core modules in a 22-module series designed to train vocational education curriculum specialists (VECS), this guide is intended for use by both instructor and student in a variety of education environments, including independent study, team teaching, seminars, and workshops, as well as in more conventional classroom settings. The guide has five major sections. Part I, Organization and Administration, contains an overview and rationale, educational goals and performance objectives, recommended learning materials, and suggested reference materials. Part II, Content and Study Activities, contains the content outline arranged by goals. Study activities for each goal and its corresponding objectives follow each section of the content outline. Content focus is on the various purposes and components of decision-facilitation evaluations, the roles of the evaluator, the development or use of appropriate criteria and methodology for decision-facilitation evaluations, and the methods for preparing decision-facilitation evaluation plans and reports. Part III, Group and Classroom Activities, suggests classroom or group activities and discussions keyed to specific content in the outline and to specific materials in the list of references. Part IV, Student Self-Check, contains questions directly related to the goals and objectives of the module, which may be used as a pretest or posttest. Part V, Appendix, contains suggested responses to the study activities from part II and responses to the student self-checks. (HD)

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VOCATIONAL EDUCATION CURRICULUM SPECIALIST

VECS

ED132415

Module 15:

Procedures for Conducting Evaluations of Vocational Education

U S DEPARTMENT OF HEALTH.
EDUCATION & WELFARE
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STUDY GUIDE

(TEACHING/LEARNING MODULE)

CE 009 206

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-Study Guide-

Module 15

PROCEDURES FOR CONDUCTING EVALUATIONS OF VOCATIONAL EDUCATION

This document is one of a series of teaching/learning modules designed to train Vocational Education Curriculum Specialists. The titles of all individually available documents in this series appear below:

INTRODUCTORY MODULES

1. The Scope of Vocational Education
2. Roles of Vocational Educators in Curriculum Management
3. Current Trends in Vocational Education
4. Organization of Vocational Education
5. Legislative Mandates for Vocational Education
6. The Preparation of Vocational Educators

CORE MODULES

1. Important Differences Among Learners
2. Learning Processes and Outcomes
3. Applying Knowledge of Learning Processes and Outcomes to Instruction
4. Assessing Manpower Needs and Supply in Vocational Education
5. Laying the Groundwork for Vocational Education Curriculum Design
6. Selecting Instructional Strategies for Vocational Education
7. Derivation and Specification of Instructional Objectives
8. Development of Instructional Materials
9. Testing Instructional Objectives
10. Fiscal Management of Vocational Education Programs
11. Introducing and Maintaining Innovation
12. Managing Vocational Education Programs
13. Basic Concepts in Educational Evaluation
14. General Methods and Techniques of Educational Evaluation
15. Procedures for Conducting Evaluations of Vocational Education

SEMINARS AND FIELD EXPERIENCE MODULE

(Seminars in Authority Roles and the Curriculum Specialist in Vocational Education, and Leadership Styles and Functions of the Curriculum Specialist in Vocational Education; field work in Project Design and Administration, Operation of School Programs, Evaluation of School Programs, Educational Research and Development, and State, Regional, and Federal Program Supervision)

INSTALLATION GUIDE

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PREFACE

Who is a vocational education curriculum specialist? The answer to this question is not as simple as it might appear. A vocational education curriculum specialist is likely to work in many different capacities, including, but not limited to: instructor, department chairperson, dean of vocational-technical education, vocational supervisor, principal, state or local director of vocational education, and curriculum coordinator.

The specialist is, perhaps, more identifiable by his/her responsibilities, which include, but are not limited to:

- planning, organizing, actualizing, and controlling the work of an educational team performed to determine and achieve objectives.
- planning, organizing, and evaluating content and learning processes into sequential activities that facilitate the achievement of objectives.
- diagnosing present and projected training needs of business, industry, educational institutions, and the learner.
- knowing, comparing, and analyzing different theories of curriculum development, management, and evaluation and adapting them for use in vocational-technical education.

This teaching/learning module is part of a set of materials representing a comprehensive curriculum development project dealing with the training of vocational education curriculum specialists. The purpose of this two-year project was 1) to design, develop, and evaluate an advanced-level training program, with necessary instructional materials based on identified vocational education curriculum specialist competencies, and 2) to create an installation guide to assist instructors and administrators in the implementation process.

The curriculum presented here is, above all else, designed for flexible installation. These materials are not meant to be used only in the manner of an ordinary textbook. The materials can be used effectively by both instructor and student in a variety of educational environments, including independent study, team teaching, seminars, and workshops, as well as in more conventional classroom settings.

Dr. James A. Dunn
Principal Investigator and
presently Director,
Developmental Systems Group
American Institutes for Research

ACKNOWLEDGEMENTS

The Vocational Education Curriculum Specialist Project was a comprehensive development and evaluation effort involving the contribution of a large number of people: project staff, curriculum consultants, a national advisory panel, and a number of cooperating colleges and universities. This wide variety of valuable inputs makes it difficult to accurately credit ideas, techniques, suggestions, and contributions to their originators.

The members of the National Advisory Panel, listed below, were most helpful in their advice, suggestions, and criticisms.

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James L. Blue	*RCU Director, Olympia, Washington*
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Ken Edwards	*International Brotherhood of Electrical Workers*
Mary Ellis	*President, American Vocational Association*
George McCabe	*Program Director, Consortium of California State University and Colleges*
Curtis Henson	*Atlanta Independent School District, Georgia*
Ben Hirst	*Director, Consortium of the States, Atlanta, Georgia*
Joseph Julianelle	*U. S. Department of Labor*
Lee Knack	*Industrial Relations Director, Morrison-Knudsen, Inc.*
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Rita Richey	*Wayne State University*
Bryl R. Shoemaker	*Ohio State Department of Education*
William Stevenson	*Oklahoma State Department of Education*

The project would not have been possible without the cooperation and commitment of the field test institutions listed below.

California State University, Long Beach
California Polytechnic State University, San Luis Obispo
Consortium of California State University and Colleges
  - California State University, Sacramento
  - California State University, San Diego
  - California State University, San Francisco
  - California State University, San Jose
  - California State University, Los Angeles

Iowa State University
University of California Los Angeles
University of Northern Colorado

Overall responsibility for the direction and quality of the project rested with James A. Dunn, Principal Investigator. Project management, supervision, and coordination were under the direction of John E. Bowers, Project Director.

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Part I:

Organization and Administration

PART I
ORGANIZATION AND ADMINISTRATION

Guidelines

This study guide has five major sections. Each section contains useful information, suggestions, and/or activities that assist in the achievement of the competencies of a Vocational Education Curriculum Specialist. Each major section is briefly described below.

PART I: ORGANIZATION AND ADMINISTRATION

PART I contains an Overview and Rationale, Educational Goals and Performance Objectives, Recommended Learning Materials, and Suggested Reference Materials. This section will help the user answer the following questions:

- How is the module organized?
- What is the educational purpose of the module?
- What specifically should the user learn from this module?
- What are the specific competencies emphasized in this module?
- What learning materials are necessary?
- What related reference materials would be helpful?

PART II: CONTENT AND STUDY ACTIVITIES

Part II contains the content outline arranged by goals. The outline is a synthesis of information from many sources related to the major topics (goals and objectives) of the module. Study activities for each goal and its corresponding objectives follow each section of the content outline, allowing students to complete the exercises related to Goal 1 before going on to Goal 2.

PART III: GROUP AND CLASSROOM ACTIVITIES

The "Activities-Resources" column in the content outline contains references to classroom or group activities and discussion questions related to specific content in the outline. These activities and discussion questions are located in PART III and are for optional use of either the instructor or the student. Both the classroom activities and discussion questions are accompanied by suggested responses for use as helpful examples only--they do not represent conclusive answers to the problems and issues addressed. Also contained in the "Activities-Resources" column are the reference numbers of the resources used to develop the content outline. These reference numbers correspond to the numbers of the Suggested Reference Materials in PART I.

PART IV: STUDENT SELF-CHECK

PART IV contains questions directly related to the goals and objectives of the module. The self-check may be used as a pre-test or as a post-test, or as a periodic self-check for students in determining their own progress throughout the module.

PART V: APPENDICES

Appendix A contains responses to the Study Activities from PART II, and Appendix B contains responses to the Student Self-Check. The responses provide immediate feedback to the user and allow the module to be used more effectively for individualized study. They have been included in the last part of the module as appendices to facilitate their removal should the user wish to use them at a later time rather than concurrently with the rest of the module.

Approximately 30 hours of out-of-class study will be necessary to complete this module.

Overview and Rationale

Evaluation is an integral part of the curriculum development process. Vocational education curriculum specialists must not only know the various types of evaluation, but must also be able to conduct or supervise evaluations and know how to use evaluation data in improving the curriculum.

The relatively recent call for accountability in education has required that teachers, students, administrators, the schools, and *the curriculum itself* be evaluated. This module contains methods and techniques for evaluating, or assessing, the effectiveness of the curriculum. Evaluation should not be a one-time activity but rather an ongoing process that continually provides data to decision-makers either to help them improve the existing curriculum, or to ensure that a new curriculum is of the highest caliber.

The first part of the module contains a description of the activities performed during an evaluation for decision-making purposes. The purposes of each activity and its relationship to the other activities is explained.

The second part of the module is a summary of the roles that evaluators are required to assume in decision-facilitation evaluations. The third part is an identification of the criteria and methods used when conducting evaluations.

The last section contains exercises in putting all evaluation data together in a form that is useful to decision-makers.

Goals and Objectives

Upon completion of this module, the student will be able to achieve the following goals and objectives:

GOAL 15.1: KNOW THE VARIOUS PURPOSES AND COMPONENTS OF DECISION-FACILITATION EVALUATIONS.

Objective 15.11 List the various phases of a decision-facilitation evaluation and state the purpose for each phase.

Objective 15.12 List and give examples of the evaluator activities performed in the three stages of decision-facilitation evaluations.

Objective 15.13 Specify the characteristics of each type of evaluation activity and indicate how it is related to the other evaluation activities.

GOAL 15.2: ANALYZE AND INTERPRET THE ROLES THAT EVALUATORS ARE REQUIRED TO ASSUME WHEN CONDUCTING DECISION-FACILITATION EVALUATIONS.

Objective 15.21 Identify the duties and functions of the persons responsible for conducting and/or supervising the various evaluation activities.

Objective 15.22 Select the proper role of the evaluator in each of the decision contexts.

GOAL 15.3: DEVELOP OR USE APPROPRIATE CRITERIA AND METHODOLOGY FOR DECISION-FACILITATION EVALUATIONS.

Objective 15.31 Identify the factors or criteria the evaluator must consider when determining procedures for collecting decision-facilitation information for each of the several evaluation activities.

Objective 15.32 Make informed decisions regarding the kinds of data to collect and the general methods to be used in collecting and analyzing that data for each of the several evaluation activities.

Objective 15.33 Select appropriate instruments for collecting evaluation information.

GOAL 15.4: KNOW THE METHODS FOR PREPARING DECISION-FACILITATION EVALUATION PLANS AND REPORTS.

Objective 15.41 Prepare an evaluation plan.

Objective 15.42 Identify the proper times during the course of an evaluation when reports to the project or program operators should be submitted.

Objective 15.43 Identify and prepare evaluation reports that will provide decision-makers with needed information about educational programs or projects.

Recommended Materials

All necessary materials are included in this guide.

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Part II:

Content and Study Activities

PART II
CONTENT AND STUDY ACTIVITIES

Goal 15.1

Content Outline	Activities-Resources

Goal 15.1: Know the Various Purposes and Components of Decision-Facilitation Evaluations.

A. The CSE Model for Decision-Facilitation Evaluation

1. The Center for the Study of Evaluation (CSE) Model for educational evaluation was chosen as the decision-facilitation evaluation model for use in this module because it is most consistent with the procedures and techniques advocated in Module 13, "Basic Concepts in Educational Evaluation" and Module 14, "General Methods and Techniques of Educational Evaluation." (1) (2) (26)

B. Stages of the CSE Model

1. There are three major stages of decision-facilitation evaluation in the CSE model. Each stage has two phases and a purpose, or decision, toward which the evaluation is conducted:
   a. Preformative Stage
      (1) The first phase of this stage is needs assessment.

(1) "Methods and Theories of Evaluating Programs."

(2) Evaluation and Decision-Making: The Title VII Experience is a particularly good source.

(26) Educational Evaluation succinctly describes the CSE Model and its purposes, pp. 37-39.

        (2) The second phase is program planning.
        (3) The purpose of this stage is to provide information to the decision-maker so that goals may be selected and specific programs set up to meet particular needs.
    b. Formative Stage
        (1) The first phase in this stage is implementation evaluation.
        (2) The second phase is progress evaluation.
        (3) The purpose of this stage is to provide information to the decision-maker on how the program is being implemented and operated and what results are occurring so that the program may be modified as needed.
    c. Summative Stage
        (1) The first phase in this stage is documentation evaluation.
        (2) The second phase is outcome evaluation.
        (3) The purpose of this stage is to provide information to the decision-maker on how the program was actually conducted and what the results were so that a decision can be made whether to continue or discontinue the program, or further modify it.

2. In each evaluation phase, or evaluation activity, the evaluator must see that four processes are completed.
    a. Determine context (or decision area). What decision needs guide the evaluator's conduct?

   b. Select appropriate information.
   c. Collect and analyze data.
   d. Report summary information.*

3. All activities in the CSE model are interrelated. Figure 1 on page 16 of this guide shows the interrelationship of five of the evaluation activities. Figure 2 includes the latest addition to the model, the documentation phase. * *
4. Other decision-facilitation evaluation models may be used when the CSE model will not fit the situation; these are the CIPP model (30), and the Discrepancy model (28).

* See Discussion Question A in Part III.

* See Classroom Activity 1 in Part III.

* See Discussion Question B in Part III.

(30) Educational Evaluation and Decision-Making.

(28) Discrepancy Evaluation.

C. Study Activities

Based on your reading of the content outline and the information provided with the study activities, complete the following activities.

Decision-Facilitation Evaluation

Evaluation for decision-making purposes is a continuous process. Ideally the evaluator is involved with a program or curriculum from planning to development, through operation, and then on to the judgment stage. Because evaluation in vocational education is viewed as a continous process for providing information to decision-makers, the CSE model for evaluation (see Module 14) will be employed in this module. The CSE model was chosen not because its procedures are considered superior, but because they are very similar to those normally employed in the vocational curriculum development process. Most of the activities conducted when following the CSE model are also conducted in the CIPP model, the Discrepancy model, and other decision-facilitation evaluation models.

The CSE Model

The CSE model defines educational evaluation as the process of determining the kinds of decisions that have to be made; selecting, collecting, and analyzing the information needed in making those decisions; and then reporting the information to the appropriate decision-makers. Evaluation information is gathered and reported by the evaluator to help decision-makers decide among optional courses of action when faced with problems such as how a program might be improved, or whether a program should be modified, continued, or terminated.

There are three major stages to the CSE model, the Preformative, the Formative, and the Summative. In each stage two major evaluation activities are conducted for specific decision purposes.

In the Preformative stage are the evaluation phases, or activities, of needs assessment and program planning. The purpose of needs assessment (which is always performed when developing vocational curricula) is to provide information for goal selection. The major purpose of program planning evaluation is to provide information that will aid in the selection or development of a program. In essence, needs assessment asks what will be needed, program planning evaluation asks what program will meet those needs.

The Formative stage of the CSE model is concerned with what is being done and what is resulting. The purpose of both phases, or activities, of the Formative stage, implementation and progress evaluation, is to provide information that will help the decision-maker modify the program while it is still flexible.

The Summmative stage of the CSE model is concerned with what the end results were. The documentation evaluation phase, or activity, involves collecting information that shows how the program was actually implemented; the outcome evaluation measures the results or outcomes obtained by the program. The purpose of both activities of the Summative stage is to provide information to the decision-makers that will help them decide if a program should be continued, discontinued, or further modified.

1. List the three major stages of the CSE model for educational evaluation, the major purpose of each stage, and the decision area serviced by each stage.

CURRENT MODEL

Definition. The current model defines *educational evaluation as the process of determining the kinds of decisions that have to be made; selecting, collecting, and analyzing information* needed in making these decisions; and then *reporting this information to appropriate decision makers.* Thus, evaluation information should help decision makers in deciding among alternative courses of action, such as how a program might be improved. As may be seen from the figure on the next page, the Center has identified four major kinds of decisions that have to be made (indicated by diamonds) and these are associated with five phases of evaluation activities. The basic features of these decisions and phases are as follows:

Needs Assessment involves stating potential educational goals or objectives (preferably in terms of student performance rather than instructional processes), deciding which of these are of highest priority, and determining how well the existing educational program is meeting these objectives. This latter information is then used by the decision maker to identify the major needs so that he can decide which ones should be attacked. A school superintendent, for example, might have a needs assessment conducted in his district to help him decide where educational programs should be developed or improved. For instance, it might be found that the students at one school are not doing as well as they should in chemistry while at another school the major deficiencies might be in foreign languages. It might also be disclosed that improvements are needed in student performance in English throughout the district. Thus, needs assessment findings are used in determining which problem areas should be attacked.

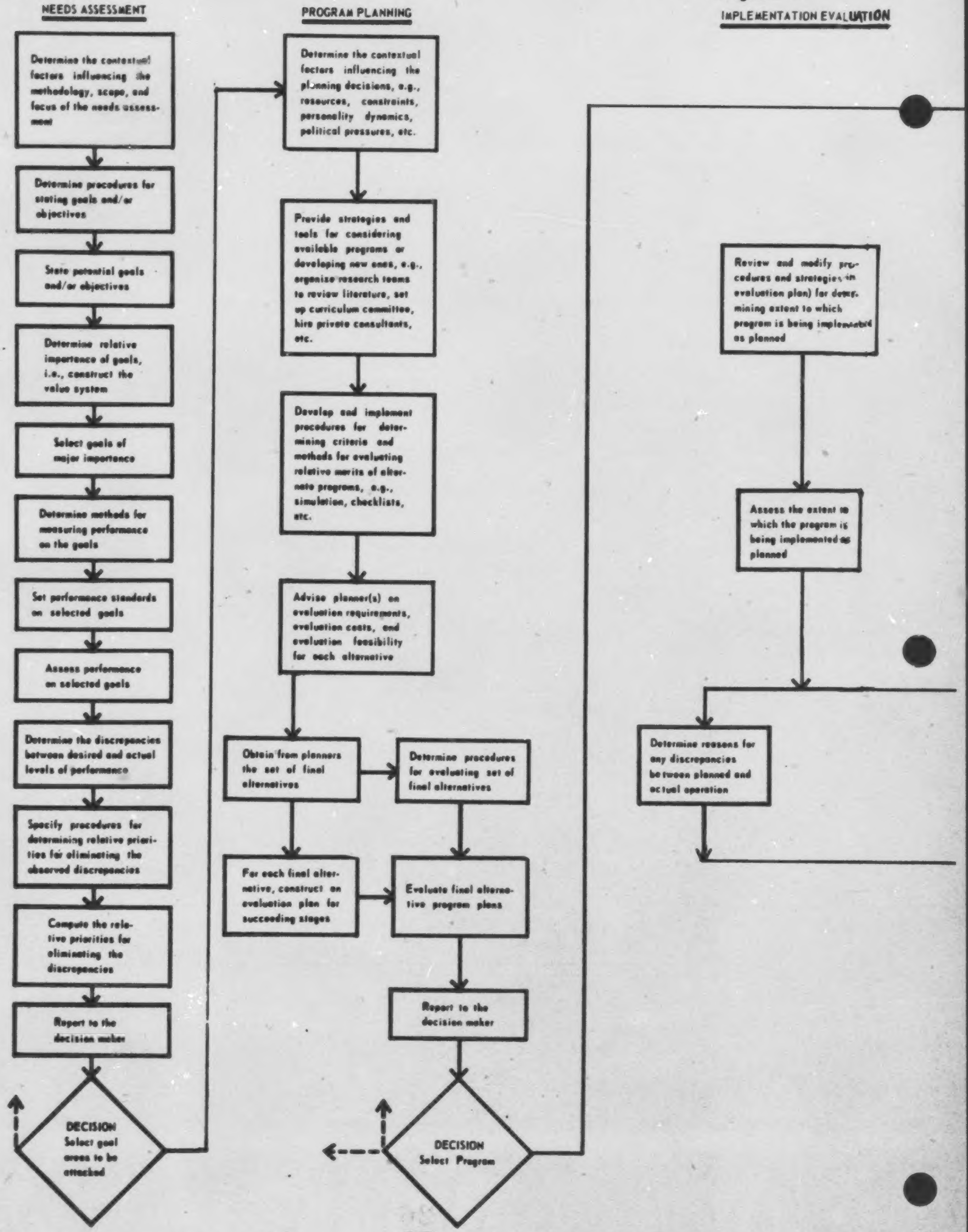
Program Planning involves making decisions about the kinds of programs or combinations of programs (or program components) that should be adopted to meet the problems identified in the needs assessment. Thus, a series of decisions are made about how the needs might best be met with the resources available to do the job. This activity usually involves a series of planning meetings that should result in a written document describing how the school or project intends to achieve the desired objectives. During the program planning phase, the evaluator suggests techniques to facilitate planning decisions, provides advice regarding evaluation requirements for alternative plans, and builds into the final plan the procedures necessary for carrying out subsequent evaluation activities.

Implementation Evaluation focuses on whether the procedures specified in the program plan are actually carried out in the intended manner. Thus, it involves investigating the degree to which the program plan has been *adapted* properly to the field situation. Typical implementation questions for which evaluation information is needed might be "Did the books arrive on time?" and "Are the students enrolled in the program the ones for whom it was intended?"

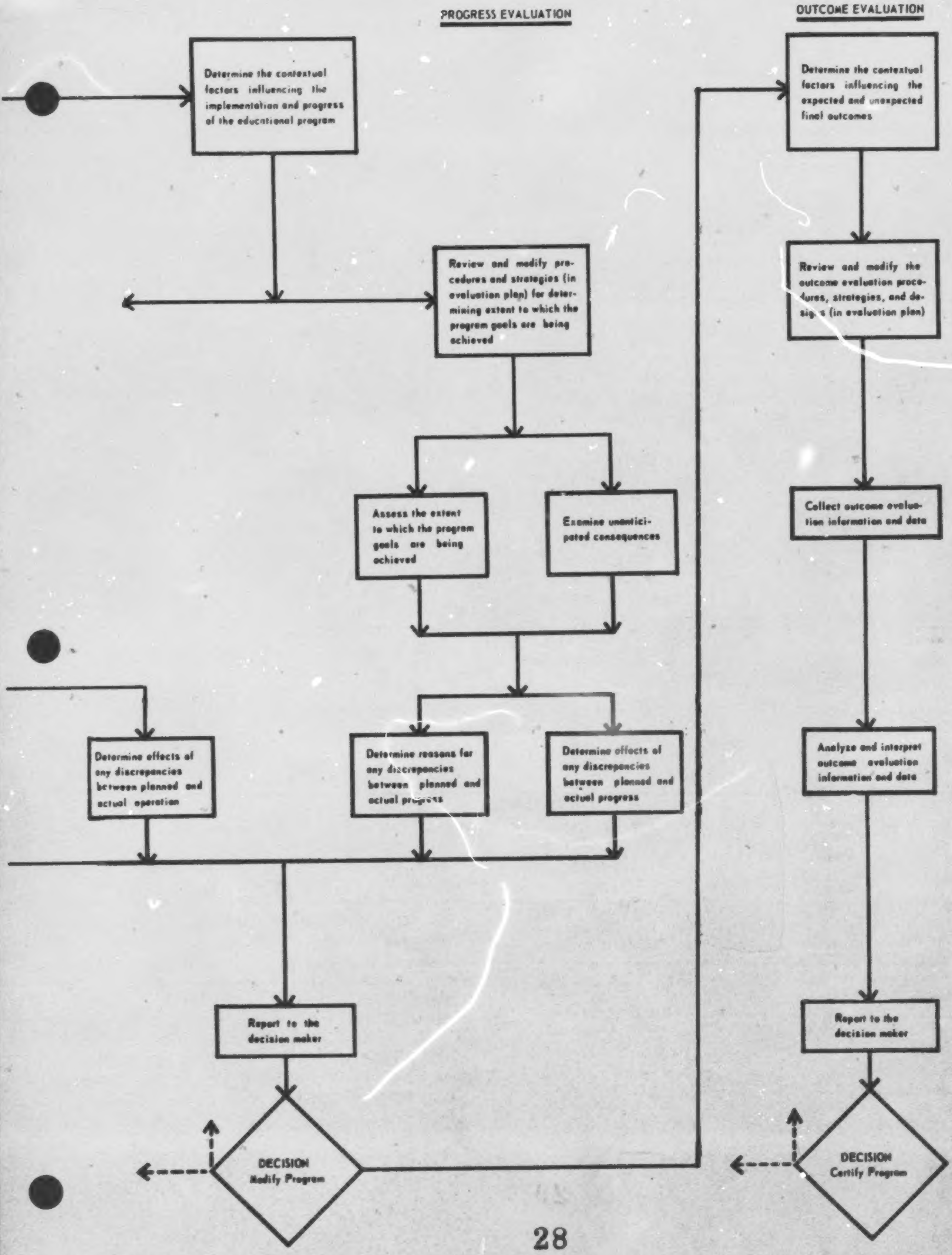
Progress Evaluation, on the other hand, is aimed at determining the extent to which the program is actually making gains towards achieving its objectives. Since a program may be implemented exactly as planned but still not reach its intended objectives, it is necessary to investigate whether the plan is really a good one to achieve the student needs. Further, it is obviously wasteful to install a program in a school in the Fall and then wait until Spring to learn that it failed or that it might have been improved if corrective action had been taken earlier. It is apparent, therefore, that decision makers need information about student progress during the course of a program so that if problems develop they can be identified and corrected quickly.

At this point, it is important to note certain similarities and differences between implementation and progress evaluations. Both kinds of activities fall under the headings of "process" or "formative" evaluations and deal with the extent to which the program is functioning properly. Further, both may lead to decisions regarding possible changes and modifications in how the program is being run. Implementation evaluations, however, deal with the extent to which the program's procedures are implemented as planned, whereas progress evaluations are aimed at determining the extent to which these procedures are producing the desired gains in student performance. Decisions about modifying the program will, of course, rely on both kinds of data since there may be problems in how the program plan is being implemented as well as in the plan itself.

Figure 1


NEEDS ASSESSMENT
Determine the contextual factors influencing the methodology, scope, and focus of the needs assessment
Determine procedures for stating goals and/or objectives
State potential goals and/or objectives
Determine relative importance of goals, i.e., construct the value system
Select goals of major importance
Determine methods for measuring performance on the goals
Set performance standards on selected goals
Assess performance on selected goals
Determine the discrepancies between desired and actual levels of performance
Specify procedures for determining relative priorities for eliminating the observed discrepancies
Compute the relative priorities for eliminating the discrepancies
Report to the decision maker
DECISION Select goal areas to be attacked
PROGRAM PLANNING
Determine the contextual factors influencing the planning decisions, e.g., resources, constraints, personality dynamics, political pressures, etc.
Provide strategies and tools for considering available programs or developing new ones, e.g., organize research teams to review literature, set up curriculum committee, hire private consultants, etc.
Develop and implement procedures for determining criteria and methods for evaluating relative merits of alternate programs, e.g., simulation, checklists, etc.
Advise planner(s) on evaluation requirements, evaluation costs, and evaluation feasibility for each alternative
Obtain from planners the set of final alternatives
Determine procedures for evaluating set of final alternatives
For each final alternative, construct an evaluation plan for succeeding stages
Evaluate final alternative program plans
Report to the decision maker
DECISION Select Program
IMPLEMENTATION EVALUATION
Review and modify procedures and strategies (in evaluation plan) for determining extent to which program is being implemented as planned
Assess the extent to which the program is being implemented as planned
Determine reasons for any discrepancies between planned and actual operation

CSE EVALUATION FRAMEWORK


PROGRESS EVALUATION
OUTCOME EVALUATION
Determine the contextual factors influencing the implementation and progress of the educational program
Review and modify procedures and strategies (in evaluation plan) for determining extent to which the program goals are being achieved
Assess the extent to which the program goals are being achieved
Examine unanticipated consequences
Determine effects of any discrepancies between planned and actual operation
Determine reasons for any discrepancies between planned and actual progress
Determine effects of any discrepancies between planned and actual progress
Report to the decision maker
DECISION Modify Program
Determine the contextual factors influencing the expected and unexpected final outcomes
Review and modify the outcome evaluation procedures, strategies, and designs (in evaluation plan)
Collect outcome evaluation information and data
Analyze and interpret outcome evaluation information and data
Report to the decision maker
DECISION Certify Program

Outcome Evaluations lead to final judgments regarding the general worth of a total program (as opposed to progress evaluations that deal mainly with program components and are done continuously throughout the program's life). Thus, outcome evaluation information is used in making decisions such as "Should we continue the program next year?" and "Should we extend the program to other schools in the district?"

Recycling Loops. The Center's model presents the five kinds of evaluation activities in a logical sequence corresponding to the usual development and operation of an educational program. It is apparent, however, that some of these activities, especially implementation and progress evaluations, may be overlapping in time. It is also apparent that decisions made at one point in a program may require repeating one or more of the preceding phases. A progress evaluation, for example, might indicate poor student performance on certain objectives. A special needs assessment might then disclose that the students did not have the requisite reading skills for the instructional materials specified in the program plan that was adopted to help them achieve these objectives and, therefore, additional planning is needed. To avoid clutter, all these recycling loops have been deleted from the figure, but are implied by the dotted arrows stemming from each of the major decisions. If all the recycling and feedback loops that might potentially be necessary were included in the figure, there would essentially be a line from each box to every other one.

Model Consistency. One important feature of the model is that it has certain consistencies across the five phase
For example, each phase starts with a context determina
tion. The purpose of this activity in needs assessment is primarily to determine the scope and level of the evaluation (e.g., are we evaluating a school or a particular reading program in that school?). Context determination also includes an investigation of the resources, constraints, social dynamics, political pressures, personalities, and environmental conditions that might influence decisions about how program and evaluation activities should be conducted. The nature and focus of context determinations do, of course, change from phase to phase. In program planning, for example, the evaluator would take into consideration the personality characteristics and biases of the planners whereas in implementation evaluation he may focus on potential environmental constraints that may inhibit the program from being run as planned.

Another important consistency is that the second step in each phase involves "setting up" the procedures that will be used in that phase. In other words, a written plan should be developed along with an explication of the rationale for it. This plan describes how the activities in that phase of the model will be conducted. As noted above, it is always possible to revise plans and procedures through recycling, but it is usually better to start with a clear idea of what you intend to do than to assume that so many changes will occur as to make it not worth the effort.

Finally, it is important to note that all evaluation activi
ties in each phase eventually lead to a report to the decision maker who in turn determines whether to drop the project at that point, recycle, or go on to the next phase.

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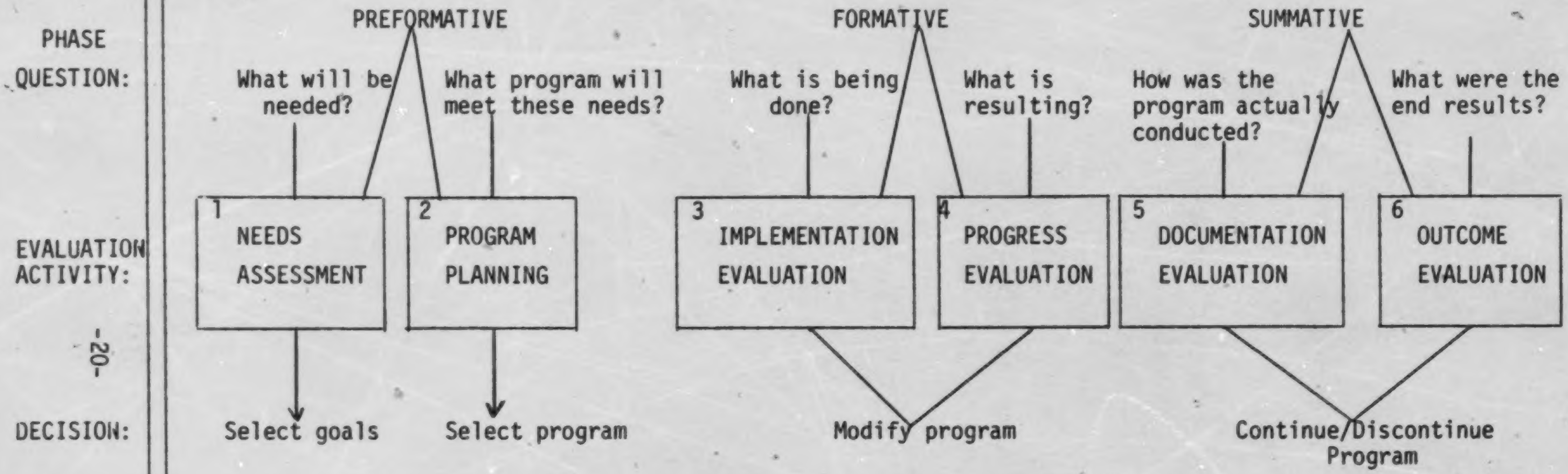
Documentation Phase

Since the previous explanation was written, another phase has been added to the CSE model. That phase, the documentation phase, and what was previously the outcome stage, now comprise the Summative stage. (See the material for Activity 1 and Figure 2.) Evaluator activities in the documentation phase consist of such tasks as collecting information on how the program was actually implemented and putting that information into a form that the decision-maker can use. The evaluation process, according to the CSE model then, consists of three stages, each of which has two distinct evaluator phases or activities. Each phase includes the processes of (1) determining the decision area of concern; (2) selecting appropriate information, (3) collecting and analyzing data; and (4) reporting summary information to decision-makers. Specific examples of evaluation activities that might be performed in the CSE from vocational education will be included in the following readings.

FIGURE 2

AN EVALUATION MODEL

(From the Center for the Study of Evaluation, UCLA)



2. List the six evaluation phases, or activities included in the CSE model for educational evaluation. List also the four processes that make up each of the six phases and give an example (from your experience) of an activity that an evaluator for a vocational education program might perform during each of the four processes in one phase of the CSE model.

Evaluation Activity Characteristics

Needs Assessment. The primary focus of the needs assessment phase of the CSE model is on identifying and delineating the goals for a project or program. There are three distinct characteristics of a needs assessment for vocational curriculum development, and hence, three distinct activities in which the vocational education evaluator will be involved. These three activities are population needs assessment, job market analysis, and occupational performance requirements analysis (task analysis).

Population Needs Assessment. The population needs assessment is a technique or process for establishing an information file that describes the population being served. To be complete, the population needs assessment file must contain the data elements required to establish the relative vocational education needs of the target population. The population needs assessment, and subsequent analysis, can show how relevant the existing goals and objectives of the vocational education system are to the social, cultural, and economic problems of the target population. Needs assessment data can serve as a basis for new objectives and goals; it can also serve as the basis for determining the success of existing vocational curriculum goals. An accurate, complete needs assessment is one of the foundation blocks for the vocational curriculum. All subsequent phases of the curriculum development and evaluation processes are based on it.

In some cases the population needs assessment is conducted by the curriculum specialist alone; in other instances, the evaluator will conduct it. The evaluator's primary role in this function is to develop or help develop potential educational goals and objectives, establish priorities among those objectives, and then determine how well existing curricula or programs meet them.

Job Market Analysis. Job market analysis is the labor supply-labor demand counterpart to the population needs assessment. While population needs assessment is a technique for establishing an information file on the needs of the target population, job market analysis is a method for establishing an information file of the needs of the occupations that fall within the categories served by vocational education. The evaluator's role in job market analysis is to (1) identify and determine the validity and effectiveness of the criteria used in conducting the analysis, and (2) ensure that the labor market analysis data are closely correlated with population needs assessment data and job performance requirements analysis. Close coordination of the three types of data is important to assure that all are used in curriculum development and program planning. As with population needs assessment, the evaluator helps the program planner establish educational goals and objectives and establish priorities among them based on the gathered data.

The emphasis of job market analysis is on determining the areas in which jobs are developing or declining, and then identifying the factors that contribute to this expansion or decline. Many sources are used in establishing the job market analysis file, including employment development services, Chambers of Commerce, labor organizations, and advisory committees. The most common data gathering device for job market analysis, however, is the questionnaire. The evaluator may play a key role in developing and validating the questionnaire and then assist in analyzing the returned data.

Occupational Performance Requirements Analysis (Task Analysis). Once population needs assessment and job market analysis have been completed and tentative educational goals and objectives have been formulated, job specifications for the vocational instructional program must be established. Such specifications include the identification of the skills and knowledge required to complete or perform a given job, and usually include information on the frequency with which a given task is performed and its relative degree of difficulty. A task analysis is usually performed with the help of individuals having skills and substantial knowledge in the occupational field for which instruction will be given. Questionnaires and interviews are two of the most common techniques for conducting task analyses, and the evaluator's role may include developing and validating the questionnaires and interview schedules.

When the population needs assessment, the job market analysis, and the occupational performance requirements analysis have been completed, the evaluator's role is to help coordinate and correlate all data and help develop the educational goals and objectives. This coordinated effort is considered the needs assessment stage of both the curriculum development process and the decision-facilitation evaluation process.

Program Planning. The program planning evaluation phase, which is also part of the preformative stage, is an outgrowth of the needs assessment phase. Its major objective is the integration of information obtained in needs assessment and information such as budget constraints and area labor plans, for the purpose of determining the kinds of curricula that will meet all needs. During this phase, the evaluator (1) suggests and helps develop systems or techniques to assure that all needs and objectives are included, (2) assures that supportive services for the proposed program are adequate, (3) identifies deficiencies that might inhibit development of the program, (4) determines whether the scope and sequence of the courses or programs are flexible enough and attainable by the students, and (5) ensures that techniques and methods for facilitating final evaluations are included in the overall plan.

Implementation Evaluation and Progress Evaluation (18). Implementation evaluation focuses on whether or not the procedures specified in the program plan are actually carried out in the intended manner. It involves investigating the degree to which the program plan has been adapted properly to the field situation. Typical implementation questions for which evaluation information is needed are: Did the books arrive on time? and Are the students enrolled in the program the ones for whom it was intended?

Progress evaluation, on the other hand, is aimed at determining the extent to which the program is actually achieving its objectives. Since a program may be implemented exactly as planned but still not reach its intended objectives, it is necessary to investigate whether or not the plan is really a good one for achieving student needs. Further, it is obviously wasteful to install a program in a school at the start of the fall semester and then wait until spring to learn that it failed or that it might have been improved if corrective action had been taken earlier. Decision-makers need information about student progress during the course of a program so that if problems develop, they can be identified and corrected quickly.

It is important to note certain similarities and differences between implementation and progress evaluations. Both kinds of activities fall under the heading of process or formative evaluations and both are concerned with the extent to which the program is functioning properly. Further, both may lead to changes and modifications in a program. Implementation evaluations, however, are concerned with the extent to which the program's procedures are implemented as planned, whereas progress evaluations are aimed at determining the extent to which these procedures are producing the desired gains in student performance. Decisions to modify the program will, of course, rely on both kinds of data since there may be problems in both areas.

Documentation Evaluation

The documentation evaluation phase is part of the summative stage, and involves collecting information that shows how the program was actually implemented. The key word in this phase is "implemented." The evaluator determines how the program was actually put into operation and how it may have differed from what was planned. Evaluator activities might include such things as observation and comparison with the program plan and interviews with students, teachers, and program planners. The information gathered and reported to the decision-maker is essential in interpreting the results of the other summative phase--outcome evaluation.

Outcome Evaluation

The final phase in the CSE evaluation model is the outcome evaluation, a process that provides information to decision-makers that will help them decide whether to extend, continue, revise, or terminate a program or course. The outcome evaluator measures the results or outcomes obtained by the program, such as placement rates, job success, student knowledge and ability, and employer and student satisfaction. The evaluator's carefully assessed measures are reported to the decision-maker, usually with recommendations for action, for the decision-maker's final action.

3. State the primary characteristics (or purposes) of decision-facilitation evaluation at each of the phases, and relate the evaluation results that are obtained to the next phase of the decision-facilitation model. Your answer may be written in narrative form but be specific. Begin with the purposes and characteristics of needs assessment evaluation and proceed to the successive phases.

(See Appendix A for possible answers.)

Goal 15.2

Content Outline	Activities-Resources

Goal 15.2: Analyze and Interpret the Roles That Evaluators Are Required to Assume When Conducting Decision-Facilitation Evaluations.

A. Primary Evaluator Purpose in the CSE Model

The primary purpose of the evaluator in the CSE evaluation model is to assist the decision-maker in reaching conclusions or decisions about a program. To do this, the evaluator must assume a number of roles during the program.

B. Evaluator Roles in the CSE Model

The most common evaluator roles in each phase are:

1. Needs assessment:
    - a. determining the need(s) for a program (context);
    - b. assisting in selecting objectives;
    - c. assisting in rating the importance of objectives;
    - d. determining if other programs meet any of the objectives;
    - e. determining the importance of the needs identified; and
    - f. reporting the results of the assessment.
2. Program planning:
    - a. determining the context in which the program planning will take place (What has to be done?);

b. assisting in program selection or development;

c. assessing quality and quantity of support services;

d. identifying deficiencies that might hinder program operation;

e. determining if objectives can actually be met with this program;

f. building evaluation into the program; and

g. reporting the results.*

3. Implementation evaluation:

a. describing how the program is being operated;

b. comparing the operation with the plan;

c. comparing the plan with other plans or programs;

d. determining if planned procedures are leading to specified outcomes; and

e. reporting the results of the implementation evaluation.

4. Progress evaluation:

a. determining and describing progress;

b. determining if progress is satisfactory;

c. comparing progress against a norm of some kind, such as another program or predetermined criteria;

d. determining the readiness of students to progress; and

e. reporting the results of this evaluation.

* See Classroom Activity 2 in Part III.

Content Outline (continued)

5. Documentation evaluation:
    - a. describing how the program was actually conducted;
    - b. comparing the operation with the plan; and
    - c. reporting the results.
6. Outcome evaluation:
    - a. determining the results of the program; and
    - b. reporting the outcome of the program.*

* See Discussion Question C in Part III.

C. Study Activities

Based on your reading of the content outline and the information provided with the study activities, complete the exercises that follow.

EVALUATOR RESPONSIBILITIES

The duties and functions of the evaluator are listed according to the phase of the CSE model for educational evaluation in which they occur. Within each phase, these duties are given in the order in which they would normally occur.

Needs Assessment

1. Determine or assist the curriculum planner to determine and list the full range of potential educational objectives for the course or program being planned. Sources of objectives for vocational education courses or programs include potential students, the community at large, the occupations or businesses to be served, and the curriculum planners themselves.
2. Help the decision-maker place a value on the objectives by determining their relative importance to the communities that vocational education serves (i.e., the students and business and industry).
3. Determine the degree to which the adopted objectives are being met by other existing programs.
4. Use the information obtained in activities 1, 2, and 3 to help the decision-maker determine the final relative importance of the needs that were defined. The decision-maker will then decide which objectives to adopt for the course or program.

Program Planning

1. Determine the context in which program planning will take place. This usually involves a series of planning meetings that result in a document describing how the decision-makers intend to achieve the desired objectives.

2. Suggest and help develop systems or techniques to ensure that all needs and objectives are included. This activity may include helping planners develop and implement procedures for selecting among optional programs.
3. Assure that supportive services are adequate for the proposed course or program.
4. Identify any deficiencies (such as staff attitude and finance) that might inhibit development of the program.
5. Determine whether the scope and sequence of the courses or programs are flexible and the objectives attainable by the students.
6. Ensure that techniques and methods of facilitating final evaluations are included in the total program plan. The evaluator may place certain restrictions on the conduct of the program, such as determining whether (or which) tests are appropriate, and determining whether students should be randomly assigned to it. These restrictions are imposed in order to ensure that the evaluation information system is built into the program plan.

Implementation Evaluations

1. Describe how the program is being conducted so that others may replicate (or avoid) its procedures.
2. Determine if a program is being conducted as planned. This function may prove useful when attempting to explain the reasons for progress or outcome evaluation results.
3. If possible, compare what has happened so far in the program with what happened in different programs. This function will help future program planners select effective procedures and avoid ineffective or poor ones. Comparison and documentation will help the present program planners or operators anticipate problems before specific procedures are incorporated into program plans.
4. Determine if program procedures are leading to the specified, planned behavior. This function is conducted in order to provide

information needed to modify planned procedures or to get planned procedures implemented properly.

Progress Evaluations

1. Describe the progress at each point in the program in order to have a basis for comparison if the program is replicated. These data will serve as benchmarks for future program operators.
2. Determine the relative degree of satisfactory progress. This information may be required for reports to program monitors or funding agencies.
3. Compare the progress made to a standard or other program in order to identify the most effective one. This information will help decision-makers weed out less effective programs.
4. Determine exactly what progress is being made in the program. This information is needed in order to identify reasons for low or high level performance so that the program can be modified.
5. Determine whether individual students or groups are ready for the next phase of the program. This function also helps the decision-maker modify the program as needed.

Documentation Evaluations

1. Collect and document information that shows how the program was actually conducted.
2. Compare the way the program was actually conducted to the way it was planned.

Outcome Evaluations

1. Measure the results or outcomes obtained by the program. For vocational education, these results might include placement rates, student knowledge and proficiency in performing the activities or jobs that they were taught, job success in terms of promotion and self-satisfaction, and employer satisfaction with the students, their attitudes and abilities.

2. Report the results of the program to the decision-maker. The evaluator usually includes recommendations for extension, revision, or termination of the course or program.

1. For each of the following descriptions of evaluator responsibilities, indicate the evaluation phase at which the activity is conducted.

   a. Selecting a set of objectives for a course from a list of instructional objectives.
   b. Reviewing the results of the program in order to decide whether that program should be continued or dropped.
   c. Developing procedures to investigate which of several kinds of instructional materials should be used in the program.
   d. Establishing standards of performance for a program that might be installed to determine whether students are exceeding, achieving, or failing to reach proficiency on objectives.
   e. Preparing an interim report on whether or not the program is on schedule in meeting its instructional objectives.
   f. Deciding upon the appropriate evaluation design to ascertain the effectiveness of the program.
   g. Investigating whether students in a program are using any special equipment properly.
   h. Determining whether the procedures that were planned for the operation of the program were in fact followed.
   i. Observing teachers to determine what they might be doing to account for their classes' unusually high or low test scores.
   j. Preparing a summary report detailing which students appeared to profit most from the program.
   k. Developing effective methods of combining the ratings of objectives which have been rated by a variety of individuals such as parents, administrators, students, workers, and employers.
   l. Interpreting the students' scores on the weekly evaluations for the teacher's own records.

m. Going back over the data collected during the course of the program to find out whether student interest in the subject matter increased, decreased, or remained the same.

n. Using a checklist to determine if the teachers followed the specially prepared lesson plans detailing the sequence for a given unit of instruction.

o. Reporting the students' average score on each of the objectives of the program's first unit.

p. Deciding how the data about a program will be analyzed and reported.

Content Outline	Activities-Resources

Goal 15.3: Develop or Use Appropriate Criteria and Methodology for Decision-Facilitation Evaluations.

A. Evaluation Criteria and Methodology

1. The determination of evaluation criteria is a function of the first activity performed in each phase of decision-facilitation evaluation, that is, determining the context. If the context within which the evaluation will take place is known, the identification of evaluation criteria follows naturally.
2. To determine the context, the evaluator asks a series of questions relative to the activity being performed--that is, relative to the phase--in the curriculum development process.
    a. Needs assessment - Since the purpose of this phase is to determine what kind of program is needed, the evaluator works closely with the curriculum developers, and in some instances may supply them with data in addition to validating the needs they discover. The primary activities of the evaluator in the needs assessment phase are: identifying or validating the needs of the community, the students, and business/industry for vocational education; analyzing the roles of the workers in the occupations selected; and selecting objectives for the proposed program (22).

(22) Evaluative Criteria.

b. Program planning - Evaluative criteria for this phase, in the form of items or data that may be obtained, are rather difficult to discern. The evaluator's role is usually to assist the program planners in ensuring that a logical planning process is followed, based upon and directed toward the needs identified in the previous phase. The evaluator helps the decision-makers integrate program needs through the use of appropriate techniques and instructional methodology, and oversees the planning to ensure that all factors pertinent to the successful operation of the program are included. *

* See Discussion Question D in Part III.

c. Implementation evaluation - Being part of the formative stage, one purpose of this evaluation activity is to provide information to the decision-makers relative to modifying the program before it becomes completely operational. The CSE model contains provisions for conducting implementation evaluations before and after instruction begins and at the end of a major unit or component of the program. In addition, the evaluator in this phase documents the extent to which the program is being implemented as planned, and notes any discrepancies between operation and plan. * *

* See Discussion Question E in Part III.

* See Discussion Question F in Part III.

d. Progress evaluation - Being part of the formative stage, criteria examined here should also relate to modifying the program in order to improve it. The evaluator asks: What results are being obtained by the program? and then compares these results with other programs if possible and with stated objectives.*

* See Discussion Question G in Part III.

e. Documentation evaluation - This activity, conducted when the program is complete, is primarily summative evaluation although project records collected during the life of the program must be saved. The primary activity is to document the actual operation of the program both to help in interpreting outcome data and to provide information for future program planners.*

* See Discussion Question H in Part III.

f. Outcome evaluation - In this phase, criteria are examined in order to place a value on the program. What actually happened as a result of the program? What was the cost of the program? How does that cost compare with similar programs?

B. Data Identification and Collection

Once criteria for evaluation have been determined, the evaluator must first identify the data that can be collected in order to examine those criteria, and then collect and analyze the appropriate data.

1. Data identification - If the objectives of a program have been clearly stated in observable or measurable terms, the identification of necessary data follows relatively easily. If

objectives are stated for the program planners and operators as well as for the students or participants, even process information, such as that needed for needs assessment, implementation, and documentation evaluations is easier to obtain (4). *

2. Data collection - The three largest variables in the data collection process are the data sources, the methods used to obtain data from the sources, and the people or devices used to collect the data (3). Data sources may include individuals in the program such as students or participants, those involved in planning and operating the program, and others in a position to observe or be affected by the program.

   Various methods are available for obtaining evaluative data from these sources. The most common methods used in education are tests of various types, observations, and records.

   The people or devices used to collect data must be consistent and reliable so that the data they collect is also consistent and reliable and can be used in decision-making.

3. Three types of indexes are typically used to measure the outcomes of processes or programs. These indexes are:
   a. behavioral, which measure the changes or modifications in behavior that occur as a result of a program;

* See Discussion Question I in Part III.

(4) Taxonomy of Educational Objectives, Handbook 1: Cognitive Domain. See also (5) "The Indirect Assessment of Social Attitudes." See also: (7) "How to Write True-False Items." See Also: (8) Measuring Educational Achievement. See Also: (12) Constructing Achievement Tests. See Also: (19) Supervision: A Synthesis of Thought and Action. See also: (20) Preparing Instructional Objectives. See also: (21) Multiple Choice Questions: A Close Look. See Also: (23) Measurement and Evaluation in the Classroom. See also: (27) An Evaluation Guidebook. See also: (31) Unobtrusive Measures: Nonreactive Research in the Social Sciences. See also: (32) Test Construction.

(3) Evaluative Research: Strategies and Methods, p. 7.

- b. other outcomes, which measure such things as changed values and attitudes; and
- c. process, which describe the program rather than measure outcomes. Process measures may be used as devices for interpreting the results of behavioral and other outcome measures.

4. Evaluation designs--The most common evaluation designs are those discussed by Campbell and Stanley (6), and by Popham (27). Major ideas regarding this general quasi-experimental class of designs are:

(6) Experimental and Quasi-Experimental Designs for Research.

(27) An Evaluation Guidebook.

- a. Statistical design is not synonymous with evaluation. (Statistical analysis is one of the tools the evaluator uses to arrive at decisions about program effect.)
- b. The purpose of statistical design is to organize and analyze information about program outcomes in such a way that clear evidence of the program effects is revealed. (Statistical analysis might include a follow-up of students to determine percentage of graduates in each of the following categories:
  - (1) in a job directly related to the training;
  - (2) in a job with some relation to training;
  - (3) in armed services with assignment related to training;
  - (4) in armed services not related to training;

(5) continuing in school for more training;

(6) continuing in school but not in a related major;

(7) unemployed and not looking for a job in the field of his training.)

c. Program effect is demonstrated by comparing outcome measures for students enrolled in the program under consideration with outcomes for similar kinds of students not enrolled in the program. Evidence of program effect can also be based upon comparison of program student outcomes and outcomes for an appropriate norm group, or with outcomes for students enrolled in similar programs prior to the introduction of the program being evaluated. (A comparison through a follow-up of graduates from vocational education and from general education as to progress on the job.)

d. Program effects should be both educationally and statistically significant (raising job placement from 54% to 56% is trivial).

e. Interpretation of the significance of the difference in outcome indicators for program and comparison students must be reliable and valid. Validity in general means that program objectives rather than other factors are being measured; reliability in general means that the objectives are measured with precision. (Follow-up surveys based on mail returns in which the response level is low--less than 50%--are not valid or reliable unless there is an attempt to spot check those who did not respond by using telephones and/or personal contact to determine if the mail data response is in agreement.)

5. Data analysis - Most data can be analyzed using descriptive statistics. (An important consideration is that the data be analyzed using the smallest independent units available, whether that be individual students, classes, or schools.) (6)
    a. The use of descriptive statistics for educational evaluation differs from that for educational research. In educational research, the statistical results are used to confirm or reject hypotheses; in educational evaluation, statistical results are used to indicate differences achieved as a result of a given treatment. Decisions are then made on the basis of the size or magnitude of the differences indicated.
    b. The analysis of evaluation data also provides information on cost/effectiveness. The evaluator provides this information so the decision-maker can decide if the program effects were worth the program costs. Cost/effectiveness comparisons of two or more programs and instructional delivery systems are often conducted.*

(6) Experimental and Quasi-Experimental Designs for Research. See also: (7) "How to Write True-False Items." See also: (8) Measuring Educational Achievement. See also: (12) Constructing Achievement Tests. See also: (23) Measurement and Evaluation in the Classroom. See also: (27) An Evaluation Guidebook, pp. 234-257.

* See Classroom 3 in Part III.

C. Study Activities

Based on your reading of the content outline and the information provided with the study activities, complete the activities that follow.

EVALUATIVE CRITERIA

There is a series of questions that educational evaluators must ask themselves, the decision-makers they serve, or the program operators, in order to determine procedures or techniques for collecting decision-facilitation information. The following questions are examples of the types of criteria about which the evaluator needs information during each of the evaluative phases.

Needs Assessment

A substantial number of evaluation criteria requirements for vocational education evaluation are found in this section. If pertinent criteria are identified in the needs assessment phase, further criteria requirement identification and the development of techniques for collecting and analyzing data relative to those criteria will be helped greatly.

1. What population information is available from local and county agencies?
2. What information is available from census records?
3. What information is available from the Employment Development Department or the Chamber of Commerce?
4. What procedures have been developed (or may be developed) to secure data from studies made by local, county, and state governmental agencies?
5. What proportion of the dropout or educationally disinterested population is being served by vocational education?
6. What proportion of the disadvantaged population is being served by vocational education?
7. Are the skills of workers presently being upgraded by vocational education?

8. Are the physically and mentally handicapped being served by vocational education?

9. What proportion of the total student population is benefiting from vocational education?

10. How many students start work without any occupational preparation?

11. What proportion of the student population enters college?

12. Are sources of data on the population known to those who conduct the analysis?

13. Is the population needs assessment periodic or continuous?

14. Is provision made for evaluating the system of analysis in order to make improvements?

15. Have individual instructors been involved in the population needs assessment?

16. Has an instrument for projecting population needs been developed?

17. Have advisory committees been involved in this analysis?

18. How is population needs data used in vocational program development?

19. What is the nature of the area served: urban, suburban, or rural?

20. Does the analysis reflect where it may be best to teach in the language of monolingual groups?

21. How is the information describing population needs kept on file and how is it kept up to date?

22. Does the population needs assessment system relate on a planned basis with job market analysis?

23. Is data gathered on all persons in the area to be served, including elementary students, high school students, postsecondary students, adults, migrants, and other individuals or groups?

24. Can an exact correlation between the needs and available training be established?

25. Is the cost of establishing and maintaining the system realistic in view of the anticipated results and benefits?

26. Once the needs analysis is established, what will be the basis for establishing priorities to meet the needs?

27. Is vocational education accessible to the entire population?

28. What vocational education curriculum changes have occurred as a result of past population needs assessments?

29. Are the population needs files used as an actual evaluation and development tool, or are they just examples for display in required plans for vocational education?

30. Is there a tendency in the population toward particular occupational areas?

31. What is the percentage of unemployment in the district?

32. What is the percentage of underemployment in the district?

33. Is it possible to identify students whose academic ambitions exceed their ability, stamina, or fortitude to succeed?

34. Do the results of collecting needs data indicate possible changes in the district's or school's philosophy and policies?

35. Is there a constant review of labor market data and its implications for curriculum development?

36. Does the district maintain up-to-date research and studies conducted in the field of labor market analysis?

37. Are the personnel involved in this function adequately trained in occupational analysis?

38. Does the district validate data from other agencies by conducting its own labor market studies?

39. Are labor market analysis data closely correlated with population needs analysis data?

40. What information is available from private business agencies or organizations?

41. How can the advisory committees participate in compiling information for occupational analysis?

42. Is the school district on the mailing list of organizations and agencies that develop job market data?

43. What criteria are used by decision-makers to determine the validity and effectiveness of the job market analysis?

44. How are job market analysis data coordinated with job performance requirements analysis, to assure that both kinds of information are used in curriculum development and program planning?

45. How much of the job market information obtained from local industry has proven accurate or beneficial in planning vocational education programs?

46. Does the secondary school cooperate with the community college in developing job information?

47. In what occupational areas are jobs developing?

48. In what occupational areas are jobs declining?

49. Why do current jobs exist? Is it because of expanding opportunities, high turnover rate, or other reasons?

50. Are the available jobs on a level that is high enough for them to be looked upon as career occupations and not merely parttime or stopgap jobs?

51. Which of the available or projected jobs are available for males? for females?

52. Which of the jobs will employ handicapped persons? disadvantaged persons?

53. Are jobs based on government contracts or other tentative bases?

54. Is the local job market steady, or is it seasonal or cyclical?

55. Is the local job market dominated by one or a few major employers? or are there a large number of relatively small employers?

56. Has information from labor unions and private employment agencies been included as part of the input of the job market analysis?

57. How many vocational programs remain in operation when the job market analysis indicates no labor market for the occupation? (Very important when developing objectives.)

58. Is the job market analysis information file used to determine the best beginning and ending dates for programs in order to achieve optimum placement in seasonal occupations?

59. In what way can job market information, job performance needs, and population needs be blended into useful program development data?

60. Does the staff perform task inventories in order to determine the existence and the extent of the tasks for the occupations for which programs are preparing students (or propose to prepare them)?

61. Are advisory committees used to analyze the task inventory and adjust the results into the program curriculum?

62. Are results of previous task analyses revalidated by conducting sample population studies?

63. Are the job requirements identified according to different skill and employability levels?

64. What percentage of the existing curriculum was formulated years ago on an unknown standard?

65. Is task analysis information available for new and emerging occupations?

66. How are students informed of job performance requirements in the various vocational education areas?

67. Do the skill steps outlined in the task analysis logically follow one another?

68. Are subject-matter specialists consulted?

69. Are funds budgeted for conducting adequate task analyses?

70. Who translates the job performance requirements into curriculum objectives?

71. What additional equipment and facilities will be needed to offer a program based on the needs assessment, task analysis, and occupational analysis?

72. How are performance standards measured before completion of training?

73. Have measurable goals and objectives been developed and published for previous curriculum development projects?

74. Have evaluation criteria been developed and written for previous projects or programs?

75. What method, technique, or rationale is used to determine which instructional units should be included in a course of study?

76. Are the tentative course or program completion requirements compatible with the needs of business and industry?

77. In task analysis is adequate consideration given to both the frequency of performance and the difficulty of learning?

78. Have complete job descriptions been developed for all occupations in the community for which training is provided?

79. Are former students surveyed regarding job performance requirements that they can identify?

80. Are entry-level job tasks separated from advanced tasks?

81. How often does the advisory committee meet to review job specifications?

82. Are present job specifications realistic in terms of learner abilities--especially entry-level requirements?

83. What methods are (or may be) used to determine the qualifications of those who supply technical data for the survey?

84. What control do unions or labor organizations exercise in the establishment of job specifications?

85. How are preconceived ideas about required skills and knowledge prevented from biasing the results?

86. Are the results of the analysis checked with other studies and surveys to check for discrepancies?

87. Are the overall objectives clear to everyone involved?

88. Are the goals and objectives realistic in terms of attainability?

89. Are goals and objectives stated in a manner that will facilitate the ease and reliability of the evaluation?

Program Planning

The major purpose of the program planning evaluation phase is to provide information that will aid in the selection of a program that will best meet the objectives set in the needs assessment phase. The questions the evaluator is concerned with in this phase help determine what the program is or should be in order to meet those needs.

1. Is program planning related to the needs established in the population needs assessment, the occupational analysis, and the task analysis?

2. Does the program planning include cost estimates?

3. Is there evidence that the recommendations of occupational advisory committees and occupational surveys, and other forms of advice by concerned community representatives is being followed?

4. Does the planned program appear to follow a reasonably logical scope and sequence?

5. Is consideration for placement service included in the planned program?

6. Is the program articulated with programs in feeder and recipient schools and other agencies?

7. Do the planning activities include input from teachers, students, employers, and graduates?

8. Is the planning preceded by the collection of appropriate data?

9. Is a community or area vocational advisory committee used?

10. Are the vocational education programs offered by neighboring vocational education facilities considered with articulation and/or duplication of effort in mind?

11. Is flexibility built into the plan in order to meet the changing needs of students and employers?

12. Are supportive services adequate for the programs?

13. What deficiencies exist that might inhibit the development of the program?

14. Is area planning realistic in terms of geographic boundaries and job opportunities?

15. What occupational training is being performed by recognized private schools in the area or other vocational programs?

16. Is the present economic base of the community considered in program planning?

17. In program planning, are provisions made for the disadvantaged and handicapped?

18. Is the scope and sequence of courses for each program flexible enough for all students?

19. Has a follow-up study added justification for existing programs?

20. How is program planning evaluated? Is it built into the system?

21. Is the proposed or existing instructional program based on needs of the students rather than on the training and ability of the teachers?

22. Are several options considered in program planning? Have cost estimates been made for each alternative?

23. Have measurable goals and performance objectives been developed and written for existing or proposed programs?

24. Do present program planning procedures involve the concepts and techniques of systems analysis?

25. Do all persons concerned with the program fully understand their role in the system?

26. How are priorities established relative to the use of funds for vocational programs?

27. Are plans written in clear, concise language that can be understood by all parties concerned?

28. Can the various evaluation efforts that will be most useful be identified?

29. What constraints (such as unobtrusive observation) govern the use of the evaluation?

30. Is the planned evaluation an integral part of the program?

31. Are the implementation and progress evaluations coordinated with the outcome evaluation?

32. Who is (or should be) involved in developing evaluation instruments?

33. How are the philosophy and goals of the program translated into evaluation instruments and/or data?

34. Does the proposed evaluation system allow for feedback or continuous input into the program?

35. As a result of progress evaluations, can immediate action be taken to resolve conditions identified as being inadequate, ineffective, or deficient?

36. Are evaluation processes established so that the information derived will easily facilitate the decision-making process?

Implementation Evaluation

The purpose of the implementation evaluation phase is to determine what is being done to implement the course or program as it was planned. The Center for the Study of Evaluation recommends that the implementation evaluation be conducted at least three times; before instruction, after instruction begins, and at the end of a major unit or component of the program. The evaluator questions in this section are organized around those three evaluations.

Before instruction:

1. Has the staff been oriented to the program and materials?
2. Are all required materials, equipment, and staff on hand?
3. Is all equipment required for the program in operating condition?

After instruction begins:

1. Is the program being implemented according to the procedures that were planned?
2. What are the reasons for any deviation from the plans?
3. Do the planned procedures that are in operation appear to be working? Why?

At the end of a major unit or component:

1. Which classes or students are succeeding? Why?
2. What has happened in other programs at this stage?
3. Are planned procedures being used? Are they working effectively? If not, why not?

Progress Evaluation

The purpose of the progress evaluation phase is to determine what is happening as a result of the program. The questions that the evaluator will be concerned with in this phase help identify criteria that indicate how the program is progressing. The first progress evaluation is usually conducted at the same time as the last implementation evaluation, that is, at the end of a major unit or component of the program.

1. How much progress toward the specified objectives has in fact been made?
2. Is the progress up to the time of evaluation satisfactory?
3. Is the program operating within budget limitations?
4. Does the progress compare with competing or other programs in the area?

5. How can the amount of student progress be determined?
6. Are the students ready to progress to the next unit of instruction?
7. Could the students have moved to the next unit earlier?
8. Have circumstances beyond the control of the program operators (strikes, etc.) impeded progress?
9. Has all student progress (or lack of progress) been a direct result of the program?
10. Are program planners involved in the progress evaluation? (Possible bias indicated if "yes.")
11. Have students dropped out of the program? If so, why?
12. Are the students motivated or challenged by the program?

Documentation Evaluation

The purpose of this phase of the decision-facilitation evaluation is to determine how the program was actually conducted. Documentation evaluation is summative, that is, it occurs after the program has been completed. The questions the evaluator asks are concerned primarily with what happened during the program and why. The answers to these questions will be helpful in interpreting the answers to the questions the evaluator asks in the outcome phase.

1. Was the program conducted as planned?
2. What deviations occurred, and why?

Outcome Evaluation

The purpose of the outcome evaluation is to measure the results or outcomes obtained by the program. These outcomes are by necessity related to the original goals and objectives although unintended results may appear.

1. How will evaluation results be used to determine the initiation, maintenance, or deletion of this or other programs?
2. What evidence indicates the degree to which the objectives have been met?

3. How are placement statistics and information used in the evaluation of a vocational program?

4. Are inferential statistical treatments applied to the data collected for evaluation purposes? If so, which ones?

5. Do the evaluation instruments (such as tests) have empirical validity? (Do they really measure what is intended?)

6. Is there a follow-up system to provide information on the effectiveness of the program?

7. Did all students who started finish? Why? Were they placed early?

8. What importance should be placed (or is placed by program decision-makers) on statistical data in relation to qualitative data?

9. Does the summative evaluation involve those persons who will be responsible for making changes or terminating the program?

10. What method (for example, personal observation; standardized written, oral, or manipulative tests; criterion measures; placement; follow-up) is used to measure attainment?

1. In the space preceding each of the following decision questions, place the letter of the evaluation phase in which the question is asked.

   a. Needs Assessment

   b. Program Planning

   c. Implementation Evaluation

   d. Progress Evaluation

   e. Documentation Evaluation

   f. Outcome Evaluation

_____ 1. How much net gain did the program participants experience compared to previous groups?

_____ 2. How much progress have the program participants demonstrated?

_____ 3. What should the objectives of the program be?

_____ 4. Are all students ready to begin the next unit of instruction?

_____ 5. Why are teachers not following the prepared plans in their instruction?

_____ 6. Was the program conducted as planned?

_____ 7. Have provisions been made for continuous evaluation of the program?

_____ 8. Were any programs in the past designed to meet the same objectives?

_____ 9. Have all objectives been met?

_____ 10. Has an occupational analysis been conducted to determine the efficacy of offering the program?

_____ 11. What practices occurred in the program that were not a part of planned activities?

_____ 12. Was the program worth the cost?

_____ 13. Have factors other than program activities influenced the results?

_____ 14. Do all the planned procedures that are in operation appear to be working?

_____ 15. Has a cost estimate or comparison been made of the proposed program?

IDENTIFICATION, COLLECTION, AND ANALYSIS OF DATA FOR DECISION-FACILITATION EVALUATION

Data Identification

Before educational evaluators can collect data, they must first know and specify what they are trying to identify or measure. The process of specifying what is to be measured usually involves the construction and listing of a set of program objectives. One of the evaluator's roles in the needs assessment phase of decision-facilitation evaluation is to assist the program operators do just that--establish objectives for the program or course. Module 7, "Derivation and Specification of Instructional Objectives," and several other excellent sources deal with this process (see Suggested References). The underlying principle of objectives is that they be stated in a manner that describes measurable or observable behavior. This principle is illustrated by the two statements below:

1. "The student will understand educational evaluation."
2. "The student will be able to list and state the purposes of the various models or conceptions for educational evaluation."

The second statement is more likely to lead to the proper selection or development of measuring instruments because it clearly defines the kinds of evidence required in order to indicate whether or not the student has acquired the appropriate knowledge. The actions required of the student in listing and stating are less ambiguous than in knowing, and hence, are more easily observed and measured.

Module 9, "Testing Instructional Objectives," deals with the process of constructing instruments for measuring the degree of achievement toward an objective. Several additional sources are listed in the references. The primary rule for test item construction is that all measures, or test items, be logically consistent with the objectives they are designed to measure. Each item or combination of items should elicit a representative sample of the behaviors specified in the objectives.

If one objective is related to others, test items developed for that objective may also be used to measure the related ones. The reasons for measuring related objectives together include: (1) to provide information on unanticipated outcomes of a program; (2) to indicate how close, or to what degree, a program or student came to meeting or exceeding the objectives; (3) to provide an indication as to what level subsequent instruction or program activities should be aimed; and (4) to provide data concerning the level of difficulty or sequencing of the various objectives.

Measurement instruments fall generally into three categories: (1) those that require selected or constructed responses; (2) those that employ objective or subjective scoring; and (3) those that test and compare groups or individuals. Each measurement instrument developed and used will have one of the two dimensions of each of the three categories.

The selected response/constructed response distinction refers to whether students select their answer from a group of optional answers (provided) (as in a multiple-choice question), or whether they develop their own answer (as in a completion or essay-type question). Selected response items are generally used for assessing skill and knowledge objectives; constructed response measures are generally used for objectives that focus on the generation of ideas.

The objective/subjective scoring distinction refers to the objectivity of the person who scores or records the measure. An objectively scored measure has specific answers (provided by the test-maker) for each question; the subjectively scored measure relies on the judgment of the scorer. A multiple-choice item would be an example of an objectively scored measure, and a written essay would be an example of a subjectively scored measure. The objectively socred measure is usually preferred by decision-makers because it generally provides more reliable information.

The third category, individual/group testing, refers to whether the program participants are observed or tested singly or in groups. Group observations are preferred for several reasons, among which are economy and the increased chance that all participants will be measured under the same conditions.

Many methods or techniques can be used by the evaluator to gather data related to program objectives. (Module 9, "Testing Instructional Objectives," briefly explains the similarities, differences, and uses of measurement approaches, and the reference sources may be consulted if you desire more information.) Test items include true-false, completion, matching, multiple-choice, short answer, essays, and performance tests. Observation-type measurements include interviews, records and report analyses, and personal observations using such techniques as questionnaires, inventory lists, and checklists.

Whatever measuring methods are employed, to be of use to the decision-maker they must meet four criteria: relevance, comprehensiveness, reliability, and feasibility.

Each evaluative measure must relate to at least one of the objectives of the program. When a number of possible measures are available, the evaluator must choose the one that is most relevant to an objective or set of objectives.

Evaluative measures have to be comprehensive in order to provide the decision-maker with useful data. "Comprehensive" means that the measure must cover one or a set of objectives completely by measuring all the behavior indicated. In some cases, one measure can measure all objectives of a program, such as when a student is required to construct a product based on a given amount of instruction and practice. The product, constructed to certain specifications, might measure all the objectives of the program or course.

The third criterion that evaluative measures must meet is reliability, that is, the measurement of what is intended to be measured must be precise. The evaluator has to be careful in selecting measures to meet the reliability criterion, because as the reliability of a measure increases, the relationship of the measure to the objective or objectives often decreases. The degree of reliability is usually based on comparisons with results of similar evaluations.

Evaluative measures must also be feasible. Certain measures for objectives might not be feasible for reasons of cost, technical possibility, or human consideration. While many measures proposed for use in educational evaluations are not feasible primarily because of excessive cost, in some cases human rights or comfort might be compromised, or the technology needed might not be available. Evaluators have to examine measures to ensure that they are not too costly, too difficult to employ, or violate human rights or comforts.

The purpose and types of measurement employed will depend on the stage of evaluation being conducted, but a substantial part of measurement data will be collected by testing students or program participants. (This is especially true during the formative and summative stages.) The interpretation and validity of the information that tests yield depend on the proper construction and administration of the tests.

There are several crucial questions with which educational evaluators must be concerned when measuring student attainment of objectives. The evaluator must ask when to test or measure in order to provide decision-makers with the information they need most efficiently and effectively. Once the best testing time has been determined, the evaluator has to ensure that appropriate locations are available for testing. Test administrators have to be given detailed instructions on how to administer the test, and students or program participants must be informed of the purpose of the test and given the directions for completing it.

Data Collection (3)

It is useful to examine the three main components of the process of data collection: data sources, means of tapping the sources, and data collecting agents.

Data Sources. The sources of data are either people or recording devices. To learn about the behavior or characteristics of individuals who have participated in a program, or in the processes of the program, one could consult:

1. the individuals involved;
2. teachers, supervisors, or others involved in designing or carrying out the program; or

3. parents, co-workers, or others in a position to observe or be affected by the behavior of the individuals or the processes of the program.

Alternatively, one could design a device to record or count instances of relevant behavior. In most cases, it is best to assume bias on the part of any person used as a data source and even on the part of the automatic device, since it had to be designed by an imperfect human. The evaluator should usually choose a type of data source, however, that is assumed to have the least bias, or one that is in the best position to observe, or one that has the specialized knowledge necessary for the required data collection. And in the majority of cases, it is best (if feasible) to employ several data sources, so that their various biases and inaccuracies can be compared and at least partly understood.

Means of tapping sources. A given data source can normally be approached in a variety of ways. People may be asked questions in an interview or in a questionnaire (or in that special form of questionnaire, the test). People or their traces (the presumed consequences of their actions) may be observed and records of various kinds maintained by the observer. Observations may be made in natural surroundings or in simulated situations. The observers may be passive and simply record what happens, or they (or associates) may interact with the object of observation. The individuals may know that data are being collected about them and to some degree may thereby be influenced in the data they provide, or they may be unaware and the measurement be unobtrusive or nonreactive (31), with the data presumed uninfluenced by the individual's awareness. In some cases, the data will have already been collected and stored, so that the collection effort becomes a matter of retrieving the particular items of interest from the file, computer tape, or other repository. Since each variation in eliciting data has its limitations, the greater variety of means used to tap data sources, the better.

Data Collectors. Different people, and sometimes different types of automatic recording devices, can collect different data from the same source. Although it is important to select and train data collectors to be objective and capable at the tasks they are to perform, there may still be important variations in the data they collect. Some reasons for the variations can tentatively be identified. It is easy, for example, to think of studies in which the racial appearance, sex, length of hair, or apparent age of an interviewer almost surely influences the results. In other studies the reasons may be so subtle in origin as to be difficult to detect and therefore all the more important to guard against. In any event, it is desirable, if feasible, to employ several data collectors.

Indexes of Outcomes

For purposes of discussion, let us distinguish between outcomes in which we are interested and the indexes we use to represent or measure those outcomes. Three classes of indexes will be discussed: behavioral measures, other outcome measures, and process measures.

Behavioral measures. If a program is designed to modify behavior, then it seems logical for the evaluation measures for that program to measure behavior. To a great extent that logic is correct. When it is possible to state program objectives in behavioral terms, it is best to determine as directly as possible whether the behaviors in question have appeared, disappeared, or changed as specified. Note that in such a case it is unnecessary to collect information about other behaviors. It is also unnecessary in any but exceptional cases to identify degrees or levels of behavior. The need rather is to determine whether a specific behavior did or did not occur--a simple, two-part or dichotomous classification: a student did or did not volunteer to participate in a class activity; a smoker did or did not refrain from smoking in a given time period; a teacher did or did not praise an appropriate student behavior. In many cases it is also important to learn the number of instances when a behavior appeared or did not appear; thus, the final index might be the proportion of times, of all the times when the stimulus conditions were appropriate that a given behavior occurred.

Other outcome measures. Outcome measures of nonbehavioral types may be appropriate under two main conditions. The first condition arises when it has not been possible to state outcomes in specific behavioral terms. Suppose, for example, that the desired outcome of a program is the improvement of attitudes toward persons of diverse ethnic and racial backgrounds. Such attitudes are presumably important to the extent that they are reflected in behavior, and it could therefore be argued that it is best to measure the real behaviors rather than the hypothetical attitudes. However, this approach is not often feasible, and it is necessary, therefore, to ask people directly or indirectly to describe their attitudes. The second condition under which nonbehavioral outcome measures are appropriate is when the behavior leaves some product or other trace that can be measured. An anti-littering campaign could be evaluated by counting or weighing the amount of litter in a given area before and after the campaign.

Note that both these conditions may also prevail when behavioral measures are appropriate and feasible. In other words, nonbehavioral outcome measures can be supplementary as well as alternate to behavioral measures.

Process measures. A process measure is one that describes something about the program, rather than about its results. Examples of process measures are attendance counts, numbers of hours of instruction, degree of adherence to planned schedule and agenda, judgments of effectiveness of speakers and audiovisual aids, adequacy of facilities and control of environment, and judged receptivity and interest of participants. Process measures are generally poor substitutes for outcome measures. However, there are occasions when a process measure is appropriately used, either because of its unusual merit in a particular situation or because obtaining the appropriate outcome measure is not feasible. Suppose, for example, that measurement of the effect of a film presentation is difficult in a particular situation, but there are experts available who know the effectiveness of various types of films in similar situations. In such a case it might be preferable to use the experts' judgments (a process measure) rather than an unreliable or biased outcome measure. On the other hand, the best strategy might be to use both an outcome measure and a process measure.

It is conceivable for a process measure to be the equivalent of an outcome measure in certain situations. Consider, for example, a program that has as one objective the stimulation of continued interest on the part of participants in the program topic. Continuing attendance at the program sessions, measured in a process way, might well be a good behavioral outcome measure of the interest of the participants.

It should be mentioned also that process measures serve another purpose. They describe the program (the independent variable) as it was actually presented, rather than as it may have been planned or envisioned, and, therefore, they are an initial basis for explaining whatever effects may be found through the evaluative measurements (the dependent variable). For this reason it is generally desirable to collect a rather comprehensive set of process measures, especially during the progress and documentation phases of decision-facilitation evaluation.

Data Analysis (27)

After the evaluator has been properly concerned about instructional objectives, devised suitable ways for measuring them, and skillfully designed schemes for gathering the data yielded by these measures, the data must still be analyzed. These are a few points which can help him in this task.

Analysis Units

In most types of data analysis we compute descriptive statistics, such as the mean, median, and standard deviation, in order to economically describe the data under consideration. The units on which these numerical indicators should be calculated are the smallest independent units available. This is definitely not always the individual learner. For example, if five classes with 30 students in each are given treatments which are heavily dependent on the teacher as well as the classroom interaction of the students, then we should not calculate a mean based on the performance of 150 students but, instead, a mean based on the average performance of each of the five classes. In other words, our datum (data: plural) here would be the mean performance of a class since that represents the smallest independent sample available.

In this example, the evaluator should regard his measurements as providing five pieces of data regarding the success of his program. He might compute the mean (or median) "score" for each class and present these as five pieces of data--and he might even compute the mean or median of these five. Even though the mean of all the students' individual scores might not differ much from this latter value, to compute that figure is conceptually in error. And should the evaluator go ahead to do significance testing or inferential estimation, he needs to base his calculations on five independent units and not 150. Things aren't as bad as they seem, since means are much more stable than individual scores and you may gain power, not lose it, by analyzing five stable means rather than 150 highly variable scores.

On the other hand, if we were using the same five classes but were now evaluating individual self-instruction booklets which took total responsibility for promoting learning (with no teacher or classmate interaction), then it would be legitimate to compute descriptive statistics on the entire group of 150 learners since the datum from each pupil would be the smallest independent unit.

In spite of the fact that educators have for years conducted their data analyses on the basis of the total group of learners, the analysis unit approach described here has been strongly recommended during the past several years by leading research design specialists and should definitely be used by the educational evaluator. This means that in constituting groups by randomization, as in some of the control group designs we examined earlier, the units randomly assigned to one group or another might be classrooms (or even schools or school districts) rather than individual learners.

Thus, if an evaluator finds himself in a situation where practicalities of the ongoing educational program preclude the random assignment of individual pupils to various treatment conditions, the assignment of classroom units by random may be feasible.

Estimation Versus Hypothesis Testing

Most educators who have completed the customary statistics courses have encountered a variety of techniques with which to analyze data. Such statistical tools as the *t* test, correlation coefficient, and analysis of variance have typically been mastered by most educational evaluators. Unfortunately, because these analytic tools are within their repertoire, some evaluators always try to apply them to the analysis of performance data in evaluation studies. In some ways, these techniques are unsuitable for this purpose.

The majority of statistical techniques commonly seen in the research journals are *hypothesis testing procedures* and are designed to reject null hypotheses concerning the *existence* of a relationship between two variables. In a commonly seen situation, for example, the posttest mean performances of two groups are contrasted to see if the mean of the Method *X* group is significantly higher than the mean of the Method *Y* group. When a *t* test is applied to such data the question it attempts to answer is the following: "*Is* there a reliable difference between the two groups?" If there _is_ a reliable difference, then a relationship has been discovered between the method variable (_X_ versus _Y_) and the posttest variable.

But evaluators are rarely interested only in _whether_ there is a difference between two or more treatment groups. They are also concerned with the _magnitude_ of the difference. To yield an indication of how much difference exists between groups, hypothesis testing techniques are not suitable.

Instead, a group of statistical devices known as _estimation procedures_ can be used to supply us with an approximation, a rather precise one in some cases, regarding the magnitude of treatment differences. To illustrate, if we have detected on the basis of a particular evaluation study that Treatment A is 4.2 mean points better than Treatment B, by establishing a _confidence interval_ we can identify a range of mean differences which at a given probability level, for example, with odds of 95 to 5, would include the true (population) mean difference. For example a 95 per cent confidence interval of mean differences between 3.1 and 5.3. More stringent confidence intervals, for example, 99 per cent can also be calculated.

If the evaluator is not familiar with the procedures for computing confidence intervals and similar estimation indices, he may wish to consult a recent statistics textbook designed for use in the behavioral sciences. If, on the other hand, a statistical consultant is called in to assist in the data analysis, the evaluator should discourage his exclusive use of hypothesis testing procedures and explore, instead, the suitability of estimation procedures.

In reporting results of learner performance on the various measures of interest, the evaluator will discover that simple descriptive statistics will communicate with a wider audience than many esoteric statistical analyses which might be used. For instance, it may be sufficient to merely supply (1) the average percentage correct or (2) the proportion of learners reaching the desired criterion. The evaluator is often less interested in subtle differences that have to be teased out by sophisticated statistical techniques than he is in major magnitude differences that can be readily communicated to educational decision-makers. If hypothesis testing techniques must be used, then one of the many nonparametric tests may be suitable particularly in view of the case with which they are calculated. The most readable description of nonparametric statistical procedures is still that prepared some years ago by Siegel.* The evaluator will find the Siegel text useful.

Decision-Making in a Cost/Effectiveness Context

The educational evaluator typically is not the final decision-maker regarding the alternative courses of action associated with either needs assessment or treatment adequacy assessment. Generally, he will be supplying information to others who will make these decisions. He should, however, present a wide range of information so that these decision-makers can make wise choices.

Although the use of instructional objectives has been stressed throughout the guidebook, it must be emphasized that mere attainment of objectives is insufficient for the evaluator to reach a positive decision. For instance, suppose an instructional treatment proved effective in promoting a set of objectives but only with a financial expenditure far in excess of what could be afforded. Obviously, the decision-maker would not opt for the prohibitively expensive treatment. Putting it more generally, the evaluator should supply sufficient information so the decision-maker can contrast costs with effectiveness prior to reaching a conclusion. And the costs involved are not only financial. We can conceive of some otherwise effective instructional treatments which might be inordinately costly in terms of teachers' lowered morale.

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*Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences, McGraw-Hill, New York, 1956.

Or we might think of needs assessment evaluations which would identify certain objectives as having the highest priority on the basis of preference data and discrepancies between current and desired learner performance. Yet, to implement treatments designed to accomplish these objectives may simply be too expensive. A cost/effectiveness decision will be different than a decision based on non-cost factors.

The significance of this point is that the evaluator should present decision-makers with as much information as they might reasonably use in deciding among alternatives. We have seen previously that data regarding learner performance on objectives is crucial. Preference data which can be translated into value standards will also prove useful, as is evidence of unanticipated outcomes associated with any instructional treatment. Now we have suggested that cost data are also requisite. The more relevant data, the more effectively the educational decision-maker can function.

In reviewing this section on data collection and analysis we have examined schemes for (1) gathering preference data and (2) comparing preference and performance data. We have also seen (3) how item and person sampling can conserve data gathering time and which types of designs are particularly suitable for (4) formative evaluation and (5) summative evaluation. In addition, we have examined (6) the analysis units to be used in treating evaluation data, (7) estimation versus hypothesis testing procedures, and (8) decision-making in a cost/effectiveness context.

Popham's three guidelines for data analysis are:

Guideline Number 18. The educational evaluator should analyze data according to the smallest independent units available, frequently leading to the use of classroom or larger units rather than individual pupil units.

Guideline Number 19. The educational evaluator should, in general, prefer descriptive statistics and estimation procedures instead of statistical hypothesis testing procedures.

Guideline Number 20. The educational evaluator should present decision-makers with a wide range of pertinent information so that choices among alternatives can be made in a cost/effectiveness context.

REFERENCES

1. American Institutes for Research. Evaluative Research: Strategies and Methods. Pittsburgh: American Institutes for Research, 1970.

2. Fink, Arlene; Davies, Jeffrey S.; and Klein, Stephen P. Evaluation Workshop III: Evaluation in Program Planning. Los Angeles: Center for the Study of Evaluation, 1974.

3. Fink, Arlene, and Klein, Stephen P. Evaluation Workshop V: Progress Evaluation. Los Angeles: Center for the Study of Evaluation, 1971.

4. Klein, Stephen P.; Fink, Arlene; and Davies, Jeffrey S. Evaluation Workshop IV: Implementation Evaluation. Los Angeles: Center for the Study of Evaluation, 1973.

5. Popham, W. James. An Evaluation Guidebook. Los Angeles: The Instructional Objectives Exchange, 1972.

6. Webb, E.J.; Campbell, D.T.; Schwartz, R.D.; and Sechrest, L. Unobtrusive Measures: Nonreactive Research in the Social Sciences. Chicago: Rand McNally, 1966.

2. In the space preceding each of the objectives below, indicate what type of data would be collected by the evaluator in order to measure the extent to which the objective had been or is being achieved. The objectives below have been excerpted from several local district plans for vocational education and from vocational program or course objectives.

The data types are:
a. behavioral change indices
b. attitudinal change indices
c. process change indices

__c__ 1. To expose students to an information and recruitment program for vocational education in grades 7-12.

_____ 2. The students will develop an appreciation of mechanical skills.

_____ 3. To provide a continuous evaluation of the students, the instructional program, and of the community.

_____ 4. To develop career consciousness as an integrated part of the students' experiences in order to enlarge the number of options and alternatives for them, both in terms of occupations and further education.

_____ 5. The student will be able to correctly survey a traverse using a transit and tape.

_____ 6. To identify those individuals not now being served by vocational education and to encourage them to enroll in a program of instruction.

_____ 7. The student's awareness and appreciation of the role of gainful employment in society will increase.

_____ 8. The program will function properly at the institution or with the group implementing it.

_____ 9. The student will be able to stay-stich the curved neck edge of a bodice.

_____ 10. The student, after completing the career awareness program, will desire to obtain further education relative to his personal goals.

3. Select from the list provided the type of instrument or technique the evaluator might best use to obtain answers to the following questions and indicate it in the space preceding each numbered question. The questions may be instructional objectives or program objectives. Instruments or techniques may be used more than once.

Data collection instruments:
a. anecdotal records analysis
b. personal observations or checklists
c. interviews
d. questionnaires
e. tests (i.e., multiple-choice, true-false, etc.)
f. performance examinations (doing something)

_f._ 1. Will the student be able to properly remove and replace nuts and bolts with an air wrench?

_____ 2. As a result of this program, will teachers of elementary grades have a more positive attitude toward the career education concept?

_____ 3. Does the school board support the idea of expanding vocational education offerings in the school?

_____ 4. Will potential dropouts remain in school as a result of this program?

_____ 5. Do the program's objectives conform to legal requirements?

_____ 6. Will the student be able to correctly obtain an accurate reading of a patient's blood pressure?

_____ 7. Will the student understand the physiological reasons for nigh or low blood pressure?

_____ 8. Which students benefited most from the program?

_____ 9. What proportion of the population in the community is being served by vocational education?

_____ 10. What percentage of the students in a given school might be considered disadvantaged?

_____ 11. Are program operators conducting the program as it was planned?

_____ 12. Will the students be able to identify the qualities of a good employee?

_____ 13. Will the students be good employees upon completion of the program?

_____ 14. Is the program treating each of the specified objectives?

_____ 15. Are goals and objectives stated in a manner that will facilitate the ease and reliability of the evaluation?

_____ 16. Are all personnel involved in the program satisfied with the way it's being conducted?

_____ 17. Are the skills the students will obtain at the end of the program compatible with the needs of industry or business?

_____ 18. Will the students possess all of the skills required of them at the end of the program?

_____ 19. Are supportive services adequate for the program?

_____ 20. How frequently do job holders perform certain tasks in any given day?

4. Place a check mark (√) in the space provided only if the question refers to an evaluation data requirement for the particular phase under which it is found.

Needs Assessment

_____ 1. Does the district conduct a planned program of student recruitment?

__✓__ 2. Have measurable performance objectives already been written?

_____ 3. Is there a schedule for routine review of the program?

_____ 4. What is the percentage of dropouts in the high schools of the district?

_____ 5. Are texts and reference materials current in their content?

Program Planning

_____ 6. Do instructors regularly participate in in-service training programs or workshops?

_____ 7. What articulation agreements are in effect?

_____ 8. Is existing equipment modern and in good repair?

_____ 9. How many students have requested vocational programs?

_____ 10. Have students shown any growth as a result of the program?

Implementation Evaluation

_____ 11. What is the basis of the education being provided: student needs or employer needs?

_____ 12. How many of the students are showing cognitive growth as a result of the instruction?

_____ 13. What statistical techniques should be used to analyze student performance data?

_____ 14. Are planned procedures working effectively?

_____ 15. Is the staff ready to conduct the program?

Progress Evaluation

_____ 16. Have students achieved the specified objectives?

_____ 17. Are students interested in continuing in the program?

_____ 18. Do the teachers need help in getting any of the components of the program in operation?

_____ 19. Have all the materials arrived?

_____ 20. Is it important that this report be sent to all persons responsible for the program?

Documentation Evaluation

_____ 21. What evidence is there to the degree to which objectives were met?

_____ 22. Was the program conducted exactly as planned?

_____ 23. Are the students ready to leave the program?

_____ 24. What deviations from the plan were there in the conduct of the program?

_____ 25. How much did it cost to operate the program?

Outcome Evaluation

_____ 26. How much progress did the students make?

_____ 27. Which statistical methodology should be used to analyze student performance data?

_____ 28. Was the program conducted as planned?

_____ 29. Should the program be continued?

_____ 30. Do program results justify costs?

5. Answer the following questions:

   a. What are the two types of procedures commonly used in statistical analysis of data?

   b. What is the main difference between statistical analysis for educational research and statistical analysis for evaluation purposes?

Content Outline	Activities-Resources

Goal 15.4: Know the Methods for Preparing Decision-Facilitation Evaluation Plans and Reports.

A. Preparing an Evaluation Plan

The evaluation plan is usually submitted with an original proposal for a project or program and is an integral part of that proposal. The plan indicates how and at what times the program will be evaluated and what decision needs will be served. For decision-facilitation evaluation the plan will specify how, when, and why certain activities will be conducted during each evaluation phase. A flow chart indicating the activities and their time relationships is often included in the evaluation plan.

B. Reporting Times

In the plan, the evaluator specifies when reports will be submitted to the decision-makers. He bases the timing of these reports on when they will most effectively help in decision-making and determines this by observation and communication with the decision-makers. Reporting is always done at least once--at the end of a major stage--but reports will also usually be required at several other points during the course of a program, especially if it is a long one.

C. Evaluation Report Content and Format

1. Hawkridge, Campeau, and Trickett recommend that evaluation reports contain at least five sections. These sections are:
    - a. a summary,
    - b. a description of the context in which the evaluation took place,
    - c. an explanation of the program,
    - d. a report of evaluation results, and
    - e. recommendations (15).

(15) *Preparing Evaluation Reports: A Guide for Authors*.

2. Although the reports made for each of the six phases could include all five of these sections it is more common for only the *final* report to contain all five. The reports made for the various phases of evaluation, usually called *interim evaluation reports*, generally contain only the information necessary for making decisions. Most of these contain a brief explanation of the context in which the evaluation took place, a report of the evaluation, and evaluator recommendations.
3. The five major sections of final evaluation reports are described below. Those items often included also in interim evaluation reports are indicated with a double asterisk (**) and the evaluation phase in which they are included is indicated in the Activities/Resources column.
    - a. Summary**

      This section provides a brief overview of the program or phase being evaluated and includes:

(** Usually precedes each evaluation report, interim and final.)

(1) major objectives;
(2) context in which the evaluation was conducted;
(3) outline of evaluation techniques employed;
(4) evaluation results; and
(5) conclusions and recommendations.

b. Context **

(** Included for all reports, interim and final. The implementation and documentation phases are primarily descriptions of the context.)

This section describes the environment in which the program took place and includes:

(1) geographic locale and any of its characteristics important to the evaluation;
(2) system or institution and any of its special characteristics that would be of use to future planners;
(3) needs or justifications for the program or the particular part being evaluated; and
(4) constraints such as budgets, political atmosphere, etc.

c. Explanation of the program **

(** Among interim reports, this section is primarily included in the implementation and documentation phases, but there might be instances when it would be included also in program planning and progress evaluation phases.)

This section, which is usually one of the largest in final evaluation reports contains such items as:

(1) scope of the program, including objectives, the people involved, and their characteristics;
(2) description of program personnel, including their roles, their expertise,

duties, responsibilities, recruiting, training, and retention problems; and

(3) evaluation procedures, including the time period covered by the report, descriptions of program and evaluation activities, equipment and materials required, cost-benefit data, and budget information.

d. Evaluation report**

(** Especially crucial for progress and outcome phases.)

This section of the total evaluation report contains information concerning the achievement of program objectives. Information on the processes and products of the program are included in an attempt to clarify exactly what happened and why. Major subheadings of this section include:

(1) program objectives (specific);
(2) procedures and techniques for selecting program participants;
(3) data collection techniques;
(4) data analysis procedures and techniques;
(5) report of the results of data analysis; and
(6) conclusions reached as a result of data analysis.

e. Recommendations**

(** Included in all reports, interim and final.)

All recommendations made by the evaluator must be supported by collected and analyzed data. Recommendations to program decision-makers are just that--suggestions, not mandates. They should be phrased like a suggestion and the rationale behind them should be included.

D. Study Activities

Based on your reading of the content outline and the information provided with the study activities, complete the activity that follows.

PLANNING AND REPORTING EDUCATIONAL EVALUATIONS

Although planning and reporting are activities that occur at opposite ends of the evaluation continuum--planning being the first thing the evaluator does and reporting the last--reports are nevertheless dependent to a high degree on what was planned. What does the evaluator report, and when is it reported? The basic answer, of course, is that the evaluator reports information to the decision-maker that will meet the needs of that decision-maker at the time the particular decision is to be made. But more particularly: What are those decisions? When are the reports needed? In what form does the decision-maker need the information if it is to help him make the proper decision?

What are Decision Requirements?

This question is the first one the evaluator asks before planning the evaluation. The overall purpose of decision-facilitation evaluation is to improve the educational process. This improvement is aided by the evaluator's assistance in selecting objectives and determining the adequacy of the treatment provided by the program. The first tasks of the evaluator, then, are to determine from the decision-maker the criteria acceptable for program objectives and then provide that decision-maker with information relative to those criteria. (This step is part of the needs assessment phase of the preformative stage of decision-facilitation educational evaluation.) Similar decision requirements are identified in consultation with the decision-maker for each evaluation phase prior to implementation of the program. Decision requirements may provide the framework for the evaluation plan and the subsequent reporting of evaluation data to the decision-maker. The previous material in this guide details many of the decision requirements for each phase of decision-facilitation evaluation.

When are Evaluation Reports Needed?

In most instances, evaluation reports are required only at the end of each phase of the evaluation process, but in some cases reports may be required at other times. The exact schedule for delivering evaluation reports must be determined before implementation of the program and they always must be based on meeting the decision-maker's needs. If decision requirements serve as the framework for evaluation plans and reports, the scheduling of these reports is a second aspect to be included in the plan.

What Form Should Evaluation Reports Take? (15) (26)

Evaluation reports follow the form specified in the evaluation plan. Hawkridge, Campeau, and Trickett (15) specify five sections of evaluation reports: (1) the summary, (2) the context in which the evaluation took place, (3) an explanation of the program, (4) a report of the evaluation, and (5) evaluator recommendations.

The Summary

The purpose of the summary of the evaluation report is to provide a quick overview of the program. The summary includes the major objectives of the program, the context in which the program was conducted, and a brief description of the methods employed in the program.

An outline of evaluation techniques that were employed, the results of the evaluation, and conclusions and recommendations derived from the evaluation are also included. The summary section of the evaluation report should be no longer than a page or two.

Describing the Context

Context refers to the environment in which the program took place. The environment might include such things as the geographic area, attitudes of community and school personnel, restrictions and constraints, trends in the district or school before the program, and other special characteristics of the program or the district in which it was operated. The description of the context provides the decision-maker and other readers with a basis for the rest of the report. Context description is particularly useful to planners of future programs, as it allows them to assess the results of the present program in light of all factors that influenced it. Context description may be subdivided into three areas: (1) the locale, (2) the system or institution, and (3) other special factors.

(1) The Locale. The locale description contains such items as physical location, population density, unemployment rates, etc. The geographic location description should include characteristics only of the area the program was designed to influence, such as rural, urban, suburban, or inner-city. Population patterns such as density and mobility are included to further clarify the location factors. Economic patterns of the locale are especially important to vocational education programs. Unemployment trends should be described, as should the major occupational categories.

(2) The System or Institution. Decision-makers are obviously aware of the factors described in this section, so its importance lies mainly in serving future program planners or funding agencies. If the program that was evaluated involved one school, a system of schools, or several systems, the description should include information on the grade levels, number of students, rate of transiency or dropout, cost of education per student, and other pertinent data about the financial status or history of the system or institution.

(3) Special Factors. This category should contain the justification for conducting the program in the first place. If the evaluator was involved in the program from its inception, this information would be first hand, but if the evaluator was hired after the program was begun (as is the case all too often), this information would be available in the original proposal. In any case, the description should include a delineation of the needs for the program and how and by whom they were

identified. The description of the context should also include a brief history of the program, including answers to questions such as how was it conducted, what preceded it, how was it originated, and what special problems were encountered in gaining acceptance of the original plan.

Explanation of the Program. This section of the evaluation report is often the largest. Included in it are discussions of: (1) the scope of the program, (2) the people involved in conducting it, (3) procedures, and (4) costs.

(1) Program Scope. What were the specific objectives of the program? How many students were involved? What were their ages and grade levels? Were they average, underaverage, or overaverage achievers? Poor or wealthy?

(2) Personnel. How was the program staffed? What were the qualifications and expertise of program personnel? Were the personnel all instructional? Who planned? Who were the administrators and support personnel? It is helpful here to include short descriptions of the duties, activities, and responsibilities of the various program personnel. Any problems in recruiting or retaining personnel should be described. Again, this section is of particular help to future program planners, and also may be of use in interpreting final evaluation results.

(3) Procedures. In this section the evaluator indicates the time period covered by the present report. For which phase of the evaluation model is this report? What are the inclusive dates? What portion of the entire program evaluation is reported? Where were the activities reported herein conducted? Were any special physical arrangements necessary? Had the program been modified as the result of any previous evaluation reports or recommendations? Was progress toward specific objectives reviewed by the program staff in any way? Were deficiencies identified and remedied?

The procedures section also contains descriptions of all activities conducted in the program and descriptions of the objectives for which the activities were designed. What methods were used to conduct each activity? How much time was devoted to each activity? How were activities sequenced? What feedback mechanisms (for students, teachers, and decision-makers) were employed? How were students motivated and rewarded for their efforts?

The program explanation section also contains lists or descriptions of equipment and materials that were used. This would include any special materials and who developed them using what methods or techniques. How were the materials used in conjunction with the activities described previously? Did students or program participants from comparison groups have or use the same materials?

What role did parents, advisory groups, or business-industry representatives have in the planning and operation of the program? How were the above groups kept informed of program events?

(4) Costs. The final section of the program description contains information related to the costs or the budget of the program. Information that should be included includes funding sources, total costs, time period during which the funds were used, and per pupil costs. Program costs should be broken down by type: start-up costs, maintenance costs, continuation costs.

Popham (26) has added another dimension to costs in his analysis. He feels that it is also helpful to analyze and report costs in terms of benefits forsaken and benefits gained. The benefits forsaken category includes the options that were given up as a result of the decision to spend the money as it was spent; this category describes the cost of the program as "the highest valued opportunity necessarily forsaken" (26, p. 259). The benefits gained category includes monies returned or saved as a result of the program. An excellent example of the latter concept is provided by Ghazalah (11).

Total costs should be described by categories, and comparisons should be made with other programs and normal operating costs in the school or system. The readers of the report should also be informed of the location of more comprehensive budget data than was provided.

Reporting the Evaluation. This section of the evaluation report includes evidence that the program has or has not reached its objectives, dialogue or evidence relating to the fact that objectives were or were not achieved, and a basis for conclusions and recommendations for improving, maintaining, or terminating the program.

Depending on which phase of the decision-facilitation evaluation model is being reported, the evaluator will prepare different types of information. Two types of information are typical: process information and product information.

Process evaluation reports describe the extent to which the program was implemented as planned. These evaluation reports occur at the implementation and documentation phases of the CSE decision-facilitation evaluation model. Sources for the description of the activities include personal observations and records of equipment and services provided to the program. Generally, the purpose of process evaluation reports is to provide a description that will serve as a basis for interpreting the product-type evaluation information. Process evaluation reports generally do not provide a basis for determining quality of the program, nor do they usually provide any basis for conclusions or recommendations.

Product evaluation reports contain evidence relative to the quality of the program. This type of evaluation report occurs at the needs assessment phase, the program planning phase, the progress phase, and the outcome phase. (Actually, the needs assessment and program planning phases often contain both process and product evaluation information.) Product evaluation reports provide information that will aid the decision-maker in deciding to alter, maintain, or terminate a program. There are three general reporting areas for both the process and product evaluation types. The first (a) area contains the specific objectives that are being reported, the second (b) area contains information about program participants and the third (c) area contains information on data collection, analysis, and reporting.

(a.) Objectives. This subsection of the evaluation report contains a list of the specific objectives of the program. It is helpful to divide the objectives into the three classifications of cognitive, affective, and psychomotor. This exercise helps the evaluators clarify in their own minds the answer to the question: What do students now know, think, or do that they didn't before the program?

(b.) Participants. This subsection contains a description of procedures and techniques that were employed in selecting program participants. If a control group was used, its characteristics are described. The extent to which program participants were involved in other similar programs should be documented. The number of program dropouts and their reasons for dropping out should be listed, and any replacements for dropouts should be described. All characteristics of program participants should be described, including attendance, their commitment (voluntary or compulsory), how many and which participants received the program, and ages, sex, and any other special characteristics.

(c.) Data Collection, Analysis, and Reporting. These three areas are often included in the evaluation report as separate chapters or sections. The data collection section reports the measures that were applied to find out whether program objectives were achieved. Specific measures for each objective or group of objectives are described and often included in the report as appendices. The use of specific measures for objectives or students should be justified. The qualifications of the observers or evaluators should be listed and the times or intervals of testing or observation should be included. Once the procedures and techniques for collecting the data have been described, the actual data should be presented in a format that is easily understood by both professional and lay people.

The next section describes the analysis methods used to examine the data. Again, specific analysis techniques should be justified for each type or group of data, and the basis for judging progress or quality should be specified. Comparisons should be made with other groups or subgroups of data in the present program, and evidence (if there is any) that program participants gained from the program should be presented.

An important aspect of the report of evaluation findings is that all information be presented in simple ordinary language. Abbreviations often lead to misunderstanding on the part of people not familiar with the program. All narrative and graphic descriptions should point to, or clearly indicate, the success or failure of the program. If the findings of the evaluation indicate that the program is generalizable or replicable, it should be so stated. It it is doubtful that the program has uses in types of groups different from those who actually participated, that should also be stated. Conclusions must be succinctly stated and supported by existing (and reported) data.

Recommendations. The final section of the evaluation report would be evaluator recommendations. These should be supported by data and by the conclusions that were reached and stated earlier. Any recommendation should be referred to the conclusion that serves as its basis. Recommendations should be spelled out clearly and attractively displayed.

1. For each of the following statements, indicate the evaluation report (by phase) in which the statement would most likely appear for a decision-facilitation evaluation. In some cases, the statement might be employed in two of the phases, such as progress and outcome.
   a. Three available pre-packaged programs were examined in an effort to find one that included all project objectives.
      program planning

b. Only one-third of the materials required to conduct the first activity were on hand when instruction began.

c. The recommendations of the advisory committee were all translated into measurable objectives for the program.

d. No statistically significant differences were found between program participants and control group members.

e. It was decided that parents and program sponsors would be advised of progress in monthly newsletters.

f. All students had achieved the first four objectives by the end of the first month of instruction.

g. The forty-seven objectives were then rated by the members of the advisory committee in an effort to determine the most important twenty.

h. It is apparent from an analysis of the data that the program must be modified to include . . .

i. The academic subject area teachers readily accepted the added responsibility of including the career-related concepts in their instruction.

j. The following procedures that were originally incorporated in the program plan were completely ignored . . .

k. The average score on the test for the first unit of instruction indicates that the students have improved on all objectives except number three.

l. It was decided that a nonequivalent control group would be the most appropriate evaluation design to determine the students' progress toward the objectives.

m. The carpentry teachers did not discover that they were using the new lathe improperly until the middle of the final semester.

n. It appeared that the students who had attended the six out-of-class field sessions fared better on objective nine than did the remainder of the students.

o. Students displayed a marked increase in career awareness as a result of the program.

Part III:

Group and Classroom Activities

PART III

GROUP AND CLASSROOM ACTIVITIES

Classroom Activities

NOTE: The following activities are designed for use in the classroom to stimulate discussion on specific topics covered in this module. The activities are designed to be used following student self-study; however, depending on the background and abilities of students, these activities may not require previous study. All classroom activities are keyed to the Content Outline to indicate an appropriate point at which they might be presented.

1. On the chalkboard, draw Figure 2 as it is shown in the Study Guide on p. 20. While discussing it with the class, draw arrows from one phase to the next showing their interrelationship. Use solid lines to indicate progression and dotted lines to indicate recycling. For example, the activity "Select Goals" would have a solid arrow leading to the phase Program Planning, indicating that once the goals were selected, the next logical step would be to begin planning the program. Each of the activities would have dotted arrows leading back into the phase during which it was performed and then back to the preceding activity. These dotted arrows indicate a recycling process that might (or must be) conducted in the event that the results of an activity required that part of the program be revised.

2. Situation (9)

   The program planners for the Vocational Education Curriculum Specialist Project are almost ready to begin their activities. Before beginning, they want to be certain that the responsibility for important jobs is assigned to appropriate persons. The people involved with the project fall into three general categories--instructional developers, organizers, evaluators--and include teachers, writers, administrators, and the evaluator. The class is to help the program planners assign the planning jobs described below to the appropriate individuals, that is, those immediately responsible for them. You may wish to read the job descriptions to the class (or reproduce them) and then discuss why the people indicated were chosen.

Job Descriptions	Appropriate Person(s)
1. Recommending where to go or whom to consult for information that might be needed in selecting the program or aspects of the program. For example, providing names of vocational education agencies that have lists of available programs.	1. (Evaluator)
2. Suggesting procedures for collecting information about the program's progress at different stages of its development. For example, determining whether written performance tests are necessary or appropriate and whether other measures will also be appropriate.	2. (Evaluator-- The monitoring of program progress should be built into the program.)
3. Choosing a program that meets the needs of vocational education as identified in the needs assessment phase. For example, choosing one type of program over another.	3. (Decision-maker)
4. Identifying where the program might be budgeting too tightly for materials, thereby diminishing the quality of instruction. For example, demonstrating that the use of programmed learning materials rather than written texts is likely to increase achievement.	4. (Media specialists-- This is an immediate responsibility of members of the instructional staff (writers).)
5. Participating in program-planning activities. For example, attending some or all planning meetings.	5. (All staff persons)

	Job Descriptions (cont'd.)		Appropriate Person(s) (cont'd.)
6.	Placing restrictions on the field test of the program. For example, randomly assigning students to programs.	6.	(Evaluator--the evaluator has a better grasp of research designs.)
7.	Providing checks on the accuracy and relevance of the program's academic subject matter. For example, checking to see that students are learning the most recent information on vocational legislative mandates.	7.	(Subject matter experts)
8.	Identifying and preparing the important components of a program plan so that it incorporates a description of the cost of the total evaluation. For example, detailing the evaluation budget, including the costs of administering and scoring measures in the field test operation.	8.	(Evaluator)
9.	Suggesting methods or techniques for making teaching and learning as effective as possible. For example, making provisions for individualizing instruction each time a new concept is to be learned.	9.	(Subject matter experts and media specialists.)
10.	Estimating the degree to which people involved in the program operation are committed to its systematic planning. For example, establishing the extent to which individuals believe that systematic program planning will result in better or improved learning materials.	10.	(Evaluator)

3. Situation

Instructor Ames has had several years of teaching experience in a large electronics technology associate degree program at a local community college. In talking to the employers of many of the program's graduates, he finds that the employers are not satisfied with the graduates' troubleshooting performance. Since the electronics technology program is heavily loaded with classroom and laboratory troubleshooting experiences with a focus on both principles and applications, Mr. Ames becomes rather annoyed, not to mention confused.

The other instructors in the electronics technology program are well qualified and seem to have done a good job in otherwise preparing their students.

Mr. Ames and the other electronics instructors put their heads together and decide that their program lacks a high quality, easily programmed, troubleshooting simulator. There are three simulators on the market, one by the Do-All company for $7,000; one by the Do-Some company for $4,300; and one by the Do-Little company for $1,500. The four instructors don't know which of the simulators would be best; the Dean of Vocational Education wonders if the problem is lack of simulator or lack of good instruction.

There are two problems then: 1) which of the simulators is best for the situation (the instructors' problem), and 2) is the problem lack of good instruction or lack of a simulator (the dean's problem)? You are an evaluation consultant called in to assist the dean and the instructors with their problems. Assume that all three simulators can be obtained on loan from the manufacturers for one year for field test purposes, and assume that twelve classes at the college emphasize troubleshooting.

Have the students discuss what kind of evaluation design they would set up to determine: (1) if the program needs changing, (2) which simulator is best, and (3) if a simulator is needed at all.

Answer: A design that would allow random assignment of students to the program is desirable. The Pretest-Posttest Contrast Design would probably accommodate the situation. Three of the treatments would be instruction with each of the simulators, one treatment would be just as it always has been (without a simulator), and one group might receive a treatment consisting of a new program without a simulator. See page 40 in this guide for an explanation of the Pretest-Posttest Contrast Design.

Discussion Questions

A. Why must evaluators determine the context (or decision area) at each evaluation phase?

(This activity serves about the same purpose as does selecting objectives before conducting a program. It guides the evaluators in performing the work that is needed for specific decisions.)

B. What are the characteristics of each evaluation activity, and how are they related?

(This question may be answered most fully by outlining the CSE model on the board and discussing the activities of each phase. Stress the differences in purpose.)

C. What are some technical skills that an evaluator must possess or be familiar with in order to conduct a thorough, comprehensive evaluation?

(Some necessary skills are:
1. oral and written communication;
2. test and measure construction and administration;
3. ability to conduct or interpret statistical analysis.)

D. What are some criteria that the evaluator must examine in the program planning phase?

(some examples are:
a. What demonstrated or identified needs serve as the basis for planning?
b. Are costs considered?
c. Is the proposed program feasible in terms of psychological or philosophical limits or constraints?
d. Are provisions for continuous evaluation built into the program?
e. Is the program a duplicate of an existing program?
f. Who contributes to the planning process?
g. What characteristics might enhance or limit a student's chances for success in the program?
h. Are time lines established in the plan?
i. How may evaluation data be recycled back into the plan?
Many other questions can be asked regarding the efficacy of the proposed program; all of these should be aimed at ensuring efficient operation and needs satisfaction.)

E. What are some criteria that the evaluator might examine in the implementation evaluation phase?

(Criteria include:
1. Before instruction: Is everything that is required to conduct the program ready to go?
2. After instruction begins: Is the operation of the program successful when the plans are followed?
3. At end of major unit: Do students or participants appear to be achieving the program objectives?)

F. If a program has five major phases, how many times could implementation evaluation activities conceivably be conducted during the life of the program?

(Twelve--before and after instruction begins in each of the first four units, and at the end of each major unit. If the program is modifiable after the last unit, the number could go to fifteen, but usually the final evaluation is outcome.)

G. What are some criteria that are examined in the progress evaluation phase?

(Criteria include:
1. Are factors outside the program influencing results?
2. Are students able to progress efficiently?
3. Are budget limits being observed without impeding the program?
4. Exactly how much progress have the students made?)

H. What makes the documentation phase different from the outcome phase?

(The documentation phase is an impartial accounting of the actual operation of the program and a description of how it differed (if it did) from what was planned. In the outcome phase, data are collected and analyzed in order to determine the results of the program.)

I. What are some specific types of data that one might collect for evaluating a new program in an occupation such as (your choice)?

(Answers will depend on the program chosen, but they should be of the type obtainable from specific measurable objectives.)

Part IV:

Student Self-Check

PART IV

STUDENT SELF-CHECK

TO THE STUDENT:

Unlike the other modules in this series, this student self-check involves a fairly lengthy writing task. It would be impossible to predict the form of your response if you are taking this examination as a pretest, but if you are taking it as a posttest, your answer should include those items and sections that have been indicated as common to evaluation reports.

Read the following situation and then perform the tasks that are indicated. You may, in many instances, have to provide fictitious data and fictitious results, but be sure your answers include the necessary material and are written in a logical, readable form.

SITUATION:

The United States Office of Education has released a Request for Proposals (RFP) to develop a program to train vocational education curriculum specialists. The RFP asks that the project be of two years duration and that all materials developed be in a form that may be used in undergraduate or graduate level university courses. The materials must also be in such a form that students can use them with a minimum of outside instruction.

You are invited by the school of education of a university that is bidding on the project to serve as the external evaluator. Your first activity is to assist the program planners in preparing the proposal for the project. The proposal must contain the goals and objectives of the project, an outline or description of activities to be performed, materials to be generated, a time schedule giving the dates at which portions of the project will start and end, and a budget for the project.

Assume then that the project is granted to the university and is funded for a total of $1 million for the two years, and that you are retained as the project evaluator.

TASKS:

1. Develop an evaluation plan for a decision-facilitation evaluation of the project. (This would normally be included with the project proposal.)

2. Select evaluation criteria that the decision-makers might need examined. Some criteria are necessarily related to the project objectives, so you may have to write a few objectives. Include other criteria, such as costs, instructional effectiveness, etc., that require examination in order to facilitate decision-making by the project operators.

3. Delineate possible methods for collecting decision information for this project, that is, what techniques or devices may be used to examine the criteria selected above.

4. Construct a mock evaluation report for each phase of the evaluation. The reports should be consistent with a decision-facilitation evaluation orientation, and should contain all information required to make decisions concerning development modification, continuation, or termination of the project.

Part V:

Appendices

PART V

APPENDICES

Appendix A:
Possible Study Activity Responses

GOAL 15.1

1. Stage 1 - Preformative
   Purpose - find out what is needed and what program fits best
   Decision - goal and program selection

   Stage 2 - Formative
   Purpose - provide information about how the program is operating
   Decision - modify or change program

   Stage 3 - Summative
   Purpose - provide information on what happened
   Decision - continue or discontinue

2. Activities (Phases)

   (1) Needs assessment
   (2) Program planning
   (3) Implementation evaluation
   (4) Progress evaluation
   (5) Documentation evaluation
   (6) Outcome evaluation

   Processes

   (1) determine the decision area of concern
   (2) select appropriate information
   (3) collect and analyze data
   (4) report summary information

   Evaluator Activities

   (There are a multitude of activities that could be listed here. Try to justify your answers as best as possible based on the readings. After you have finished reading the material for the next two objectives, return and recheck your answers.)

3. (This exercise could be completed in many ways. Check your answer to ensure that you have stated the purpose as it is in the reading. Each phase provides the basis upon which the next phase is conducted, i.e., the results of the needs assessment phase aid the decision-maker and the evaluator in conducting the program planning activities, etc.)

GOAL 15.2

1. (a) needs assessment
(b) outcome
(c) program planning
(d) needs assessment
(e) progress
(f) program planning
(g) implementation
(h) documentation
(i) implementation
(j) outcome
(k) needs assessment
(l) progress
(m) outcome
(n) implementation
(o) progress
(p) program planning

GOAL 15.3

1. (1) f
(2) d
(3) a
(4) d
(5) c
(6) e
(7) b
(8) b
(9) f
(10) a
(11) e
(12) f
(13) d
(14) c
(15) b

2. (1) c
(2) a
(3) c
(4) b
(5) a
(6) c
(7) b
(8) c
(9) a
(10) a

3. (1) f
(2) d
(3) c
(4) a
(5) b
(6) f
(7) e
(8) e
(9) d
(10) a
(11) b
(12) e
(13) c
(14) b
(15) b
(16) c
(17) c or d
(18) f
(19) b
(20) d

4. (1)
(2)
(3) No: belongs in program planning
(4)
(5) No: belongs in program planning
(6)
(7)
(8)
(9) No: goes in needs assessment
(10) No: either progress or outcome
(11) No: needs assessment
(12)
(13) No: outcome
(14)
(15)
(16)
(17)
(18)
(19) No: implementation
(20)
(21) No: outcome
(22)
(23) No: progress
(24)
(25)
(26)
(27)
(28) No: documentation
(29)
(30)

5. a. a. hypothesis testing procedures
b. estimation procedures

b. Educational researchers are typically concerned with the existence of a relationship between two variables--they want to be able to generalize; evaluators want to know how much the relationship is, or what the magnitude of differences is--they are interested in particulars.

GOAL 15.4

1. (a) program planning
(b) implementation
(c) needs assessment
(d) outcome
(e) program planning
(f) progress
(g) needs assessment
(h) progress or outcome
(i) implementation
(j) documentation
(k) progress
(l) program planning
(m) documentation
(n) outcome or progress
(o) outcome

Appendix B:
Possible Self-Check Responses

Procedures for Conducting Evaluations of Vocational Education

To the Instructor: Unlike the other modules in this series, this student self-check scoring key does not provide specific answers to the tasks the students are required to complete. It does provide a list of items that could be included, but because so much of the answer might be a reflection of the students' various writing techniques, you are requested to use considerable flexibility when scoring it.

Task 1 - Develop an Evaluation Plan

(Items that could be included:

- a. the evaluator's role in determining the need for a program;
- b. the evaluator's role in setting goals and generating objectives;
- c. the evaluator's role in examining and defining the type of program needed to meet the delineated objectives;
- d. the evaluator's role in the selection of a program and plan for meeting the objectives;
- e. a plan for evaluating the effectiveness or impact of the proposed materials;
- f. a plan for determining adequacy of curriculum content;
- g. a plan for determining the effectiveness of the processes required (or used) to implement the program; and
- h. a plan for determining the combined impact of the process and product on the students and on vocational education.

The students might also include a flow chart indicating major project and evaluation activities and their interrelationships during the two-year life of the project.)

Task 2 - Select Evaluation Criteria

(The types of evaluation criteria students select could be judged by how well (and if) they answer the following questions. Students might even ask similar questions instead of listing specific criteria. Both criteria and questions, however, should pertain to the evaluation phase for which they are relevant.

Needs Assessment

a. Is there a need for a program as outlined in the Request for Proposals?

b. What competencies are needed (or possessed) by people who are vocational curriculum specialists?

c. Will, or should, the program be useful to other areas of vocational education or education in general?

d. What evidence is there that once trained, the program participants will actually be involved in vocational curriculum development?

e. Is there a logical progression from the general competence base to the stated goals and objectives or do objectives have a strong relationship to competence statements?

f. Are the modules' objectives and learning activities logically related?

g. Do the stated goals and objectives represent a comprehensive program?

h. What is the value of curriculum goals, objectives, and the content areas addressed to vocational education professional development?

Program Planning

a. How may the program be useful to students of varying educational (and vocational) backgrounds?

b. Instead of creating a whole new program, could students take other courses in general education and relate the experiences and competencies gained to vocational education?

c. Given all constraints, what type of materials should be developed to meet the objectives?

d. What evidence is there that once developed (in any form) the materials will be adopted and used by schools or institutions?

e. Is an advisory committee used? Who are the members?

f. Does the planned program relate to the specified needs?

g. Will the proposed program be feasible in terms of facilities and costs required to implement it?

h. Can the curriculum be used as a part of existing courses?

i. Is the curriculum useful as a new course in vocational education preparation programs?

j. Does the installation of the program require resources that are not readily available at the adopting institution?

k. Is there consistency as to curriculum organization, sequencing, and levels of difficulty?

l. Are the competencies that are specified as intended outcomes for the trainees consistent with the goals and needs of vocational education and of the user training institution or training group?

m. Are there a variety of methods for attaining each training goal?

n. Do the competencies upon which the curriculum is built relate directly to the desired roles of a vocational education curriculum specialist?

o. Does the variety of learning activities reflect several of the service areas and occupations included in vocational education?

p. Is the competency base of the curriculum well defined and clearly delineated?

q. Was the procedure used to establish the initial competency base adequate?

r. Was the initial statement of competency adequately revised based on information gained from surveys, literature review, advisory panel input, pilot test, etc.?

s. Are supportive services adequate?

t. Is continuous evaluation built into the program plan?

u. Are people capable of teaching the program available? Are they needed?

v. Does the proposed program contain provisions for modification during implementation?

w. Does the program facilitate a genuine confrontation with the reality of vocational education?

Implementation Evaluation

a. Have all materials been completed on time?

b. Have all persons who will field test the materials been properly and completely oriented?

c. Are all planned procedures being followed?

d. What procedures not planned are being followed?

e. What outside (or non-program) factors may be contributing to the success or failure of the students?

f. Are the curriculum materials ready for use or do they require additional effort?

g. Do curriculum resources suit instructor preferences?

h. Is the program (or are the materials) ready for use in the form in which it is being disseminated?

i. What is the interest level of student materials?

All questions or criteria in the implementation phase should relate to the implementation of the program as it was planned.

Progress Evaluation

a. How much progress has been made toward specified objectives?

b. Are expenses being kept within specified limits?

c. Are students ready to progress to the next unit of instruction? Could they have progressed sooner?

d. Does the training program function properly at the institution or with the group implementing it?

e. Does the curriculum adequately cover:

   (1) basic concepts in vocational education?
   (2) the issues of (1) vocational education and the learner, (2) design, (3) development, (4) implementation and management, and (5) evaluation of vocational education programs?
   (3) the issues of (1) curriculum management in contemporary vocational education and (2) professional leadership training?
   (4) field work experience in (1) project design and administration, (2) operation of school programs, (3) evaluation of school programs, (4) educational research and development, and (5) program supervision?

f. Do individuals participating in the program acquire the knowledge, skills, and attitudes specified as the intended outcomes or is there an increase in the student's knowledge, skills, and attitudes in a positive direction as a result of the training program?

g. Is the extent of the increase in line with the desired or projected increase?

h. Is there a change in student gain attributable to differences in (a) program applications, (b) curriculum sequencing, (c) delivery mode, (d) resource application, or (e) other factors?

i. Do different groups of students (classified by institution of enrollment, mode of study, background, etc.) show significantly different outcomes?

j. Do different program sequences lead to differences in student outcomes?

k. Is there evidence for the cumulative effect of exposure to more than a single aspect of the program (such as a unit of instruction)?

l. Is there evidence for the effect of practice on material proficiency tests?

m. What do students perceive they have learned from the materials?

n. Does the teaching staff prefer to use this curriculum as opposed to that previously used?

o. Does the program facilitate a genuine confrontation with the reality of vocational education?

Questions or criteria in this section should relate to what is happening or resulting as a consequence of the program or materials.

Documentation Evaluation

a. Does the use of the program result in added or reduced implementation costs?

b. Is the program flexible enough to allow installation in a variety of institutions in the form of (a) a full degree program, (b) part of an ongoing program, (c) independent study, (d) in-service training, or (e) external and extension offering?

c. Does the program allow for credit by examination?

d. Were all planned procedures followed?

e. What deviations from the planned program occurred? Why?

All questions or criteria in this section should be aimed at describing and documenting exactly what happened in the program.

Outcome Evaluation

a. What evidence is there that concerns the cost-effectiveness of the program?

b. How are the effectiveness, adaptability, and feasibility viewed by those who are/were involved in the installation, management, implementation, and evaluation of the program?

c. Do program participants exhibit more confidence in carrying out their responsibilities in vocational education?

d. Is the program useful in the training of vocational education professionals in general?

e. Is the program useful in the training of vocational education curriculum specialists?

f. What evidence is there that the program participants are effective in planning, designing, implementing, and evaluating vocational education curriculum?

g. Are employers of program participants satisfied with the (improved) performance of the participants?

h. Is there any evidence that employers of potential program participants encourage their employees to enroll in the program?

i. Is there any evidence that employers are interested in introducing the program as an in-service program?

All questions or criteria in this section should relate to the results or outcomes of the program.

Task 3 - Data Collection

(The methods used to collect decision information (or data) will depend on the types of criteria that are selected for examination. The student should indicate in this section the evaluation design to be used, and the methods or instruments to be used to collect information within that design. Some examples of methods or techniques that the student could identify include:

a. observations (of students, program operators, and others);

b. checklists (process measures); and

c. criterion referenced measures (of students' abilities).

Keep in mind that the measuring device or technique will depend entirely on the criteria selected for evaluation (or needed for decision-making).

The evaluation design should be of an experimental type (see pp. 63-65 of the Study Guide) whenever possible in order to enhance the validity of the conclusions reached.)

Task 4 - Evaluation Report

(This portion of the student's answer should treat all six phases of decision-facilitation evaluation. Each phase report should contain the five sections specified by Hawkridge, Campeau, and Trickett (15): (a) a summary, (b) a description of the context in which the evaluation took place, (c) an explanation of the program, (d) a report of evaluation results, and (e) evaluator recommendations. You may wish to have the students write only one or two interim (or phase) evaluation reports and then outline a final report.)

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